Texas T-1 net blends data, voice, video. Page 42.

NETWORK WORLD

THE NEWSWEEKLY OF USER NETWORKING STRATEGIES VOLUME 5, NUMBER 4 JANUARY 25, 1988

INTEGRATED NETWORKS

HP allies with Codex, NTI to pitch networks

Troika will challenge IBM Enterprise Program.

BY PAUL KORZENIOWSKI
Senior Editor

PALO ALTO, Calif. — Recognizing the need to supply customers with complete network systems, Hewlett-Packard Co. has forged strategic alliances with Northern Telecom, Inc. and Codex Corp., *Network World* has learned.

Analysts report that the three companies are jointly selling their products to customers who want integrated voice and data networks. Northern Telecom offers customers PBXs, Codex supplies a variety of data communications equipment and HP rounds out the package with computers and X.25 products.

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CUSTOM NETWORK OPTION

New AT&T service to replace EPSCS

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — AT&T is developing a digital, integrated voice and data network service that will replace the existing Enhanced Private Switched Communications Service (EPSCS) now used by 17 of the carrier's largest customers.

The new Custom Network Option (CNO) will provide end-to-end digital service and will support both dedicated and switched traffic. While EPSCS is almost exclusively

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BUYER'S GUIDE

PC talk hindered by dissimilar software

BY LORRAINE STEMMLER
Special to Network World

The latest microcomputer communications software packages are easier to use. They're more powerful and user-friendly, and they sport features such as full-screen text editors, script languages with hundreds of commands, background communications, multiple simultaneous sessions and keystroke memory. So why are users still unhappy?

The problem is that communications standards are lacking, especially when it comes to multivendor connectivity. "Users are looking for more standards. In all

Continued on page 51

MANAGEMENT

Users offer strategies for winning at network planning

BY BOB BROWN
Staff Writer

Many communications managers consider strategic planning a black art, but users and consultants who have been through the process said the key to planning is knowing your business and where it is going.

While managers differ on how long-range a plan should be, how to put it together and what exactly it should entail, they agree that figuring out what the competition is doing is more difficult and less fruitful than analyzing your own company and its customers. What's more, the competition will be put on the defensive, users said, if a company develops a well-thought-out strategic plan and sticks with it.

For example, Chemical Bank in New York credited strategic planning for the development of its ChemPlus network, which officials said has helped the bank attract 60,000 new customers and $3.5 billion in new deposits, as well as win a 2% increase in market share.

ChemPlus was the result of a $10 million investment in hardware and software

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NETWORK LINE

News

- ▶ System One stocks up on T-1 and T-3 lines as it prepares to package network services for the travel industry. Page 2.
- ▶ Mitel announces plans to acquire GE's RCA Telephone Systems Business, one of the PBX market's largest distributors. Page 4.
- ▶ At a strategy meeting with Apple's top executives, DEC details its master plan to bring non-DEC computers into DECnet. Page 23.

Features

- ▶ Users looking to load PAD power onto their PCs should check out this Product Comparison, featuring two plug-in boards from Atlantic Research and Icot Network Systems. Page 87.

NEWSPAPER

ELECTRONIC DATA INTERCHANGE

Banks increase use of EDI

BY JIM BROWN
New Products Editor

When it balked at joining General Motors Corp.'s proprietary electronic data interchange (EDI) network, Pittsburgh-based Mellon Bank N.A. lost one of its major clients, PPG Industries, Inc.

PPG, which does about $600 million a year in business with GM, was forced to move its account from Mellon to Pittsburgh National Bank in order to receive EDI-based payments from its largest customer, according to Roger Bailey, manager of treasury operations at PPG.

Other financial institutions interested in retaining clients may soon find themselves in the same boat as Mellon. Corporations turning to EDI

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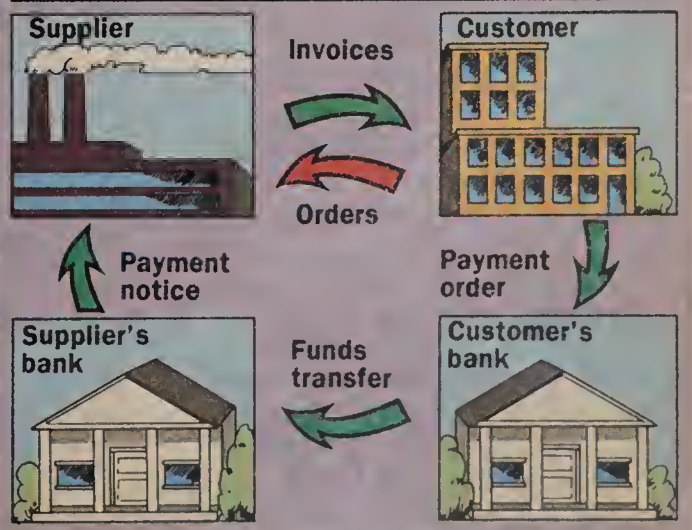
Banks enter the EDI network loop



Over electronic data interchange (EDI) networks, a customer orders goods and receives invoices from a supplier. The customer sends a payment order to its bank, which transfers funds to the supplier's bank. That bank notifies the supplier that payment has been received.

CHART BY SUSAN J. CHAMPENY

MODEM TECHNOLOGY

Vendors unite to push compression standard

BY PAUL KORZENIOWSKI
Senior Editor

WASHINGTON, D.C. — A trio of modem manufacturers is expected to join forces this week at the Communication Networks '88 Conference & Exposition here in an attempt to establish a data compression standard.

Universal Data Systems, Inc. (UDS), Concord Data Systems, Inc. and Racal-Vadic, Inc. plan to incorporate into their 9.6K bit/sec dial-up modems a data compression technique from Adaptive Computer Technologies, Inc. (ACT) in Santa Clara, Calif.

The technique, which was originally developed for Hewlett-Packard Co. three years ago, will enable users to double the amount of information transmitted over dial-up lines.

ACT's technique becomes the fourth compression alternative supported by modem manufacturers. Microcom, Inc.'s Microcom Networking Protocol (MNP) is a protocol stack supporting various functions, including two data compression options. Hayes Microcomputer Products, Inc. has a proprietary compression method.

Karl Zorzi, vice-president of marketing at Racal-Vadic, said the trio opted for ACT's technique because it was the best compression method available.

"Some compression techniques have trouble transmitting certain types of data," he said. "We tested ACT's compression with word processing, asynchronous, data base, spreadsheet and programming language data and found it worked 30% to 60% faster than other options."

Jack Freeman, senior analyst at The Yankee Group, a Boston market research firm, was skeptical about the claim.

"There are a number of compression schemes available, and the only way to see how they work is to test them with a wide range of products," he said.

Freeman said marketing considerations may be the reason why the troika endorsed ACT. "Modem vendors may be trying to get out from under the thumb of Microcom," he said.

Bill Schlosser, director of marketing at UDS, said competitive pressure was one reason for the ACT support. "MNP is controlled by a manufacturer," he said.

"Typically, Microcom adds another level of functionality to the protocol, incorporates the added functions into its own modems and gets a jump on the rest of the market before licensing the protocol to competitors. Vendors are saying that it's time for everyone to play fairly. Let's pick standards that do not supply anyone with a distinct advantage."

James Dow, president and chief executive officer at Microcom, countered, "None of the vendors contacted us about the ACT technique. If they had, we might have supported it. We develop innovative products and whenever we think our products are good enough, we offer them to the modem community."

None of the other vendors are licensing their technology to us," he said, "so I'm not sympathetic to vendors claiming we are trying to gain a competitive edge."

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UPDATE

Users: US Sprint billing woes continue

BY PAM POWERS
Senior Editor

KANSAS CITY, MO. — Users report that US Sprint is still having trouble issuing accurate and timely bills, despite its commitment to resolve its billing problems by last October. But they say US Sprint National Accounts managers have compensated for billing system deficiencies by working closely with users to resolve problems.

In a letter issued in early September, US Sprint President Robert Snedaker Jr. told customers that "by Sept. 30, we should be sending out all of our statements on time."

The letter was an effort by US Sprint to convince customers that it intends to overcome its billing problems. Those problems have taken their toll on US Sprint in the form of lost business and a tarnished reputation.

Users said US Sprint's commitment is a noble one, but that it is an unattainable goal in such a short time period. Most users reported that the carrier is still issuing bills that are one to six months late in charging for calls and crediting for payments.

US Sprint declined to comment on the issue.

"They still have a way to go," said Bard Haerland, communications manager with Unisys Corp. in Blue Bell, Pa. "They have not reached the target they set for themselves of having bills up to date and accurate by now."

The carrier's billing problems have created annoying budget problems for Haerland and other users. Without current call-detail records, he is unable to charge departments within his company for long-distance services.

A National Accounts customer in the airline business, who requested anonymity, said his billing problems have actually gotten

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Western Union's new chief operating officer, Robert Amman, carves the company into five divisions, a massive restructuring designed to mold WU into stronger financial shape. **Page 11.**

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T-1 multiplexer manufacturers are hard at work trying to complete low bit-error rate voice-sampling techniques that will enable users to squeeze 96 voice channels onto one T-1 line. **Page 15.**

DATA DELIVERY/ NET MANAGEMENT

Contel ASC combines both Ku-band and C-band technologies, a strategy that could land the company a lucrative niche in the the growing VSAT marketplace. **Page 19.**

LOCAL NETWORKING

Corvus Systems unveils three gateways that improve communications between its Omninet line of local-area network products and larger computer systems. **Page 23.**

COMMUNICATIONS MANAGER

Covia sets itself apart from the competition by revamping its Apollo airline reservation network to offer travel agents extra services. **Page 31.**

NEW PRODUCTS AND SERVICES

Micom-Interlan's new board and software enable Personal Computers on a Novell NetWare local net to access TCP/IP-based hosts. **Page 33.**

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CALENDAR **Page 86.**

HIGH-SPEED NETWORKS

Airline net firm builds T-1, T-3 net

Signs $20m pact with fiber carrier.

BY BOB WALLACE
Senior Editor

HOUSTON — System One Telecommunications last week sealed a deal valued at more than $20 million with fiber-optic carrier Lightnet, Inc. for 50 T-3 links and more than 100 T-1 lines that it will use to build one of the nation's largest private networks.

System One Telecommunications, a division of System One Corp., was established early last year by Texas Air Corp. to build and manage the voice and data networks of Texas Air subsidiaries Eastern Air Lines and Continental Airlines. The high-speed digital facilities will be used in a new 10,000-mile backbone network that will consolidate those voice and data networks.

The five-year bulk bandwidth contract calls for Lightnet to provide capacity on its 5,000-mile fiber net serving the eastern part of the country. The fiber carrier will order capacity for the western portion of the user's network from Williams Telecommunications Co., which operates a fiber network serving cities west of the Mississippi River.

The two regional fiber-optic carriers agreed last August to connect their respective nets in Chicago and New Orleans as part of a capacity interchange agreement. Either party can acquire bandwidth from the other under an agreed-upon pricing arrangement.

System One Telecommunications hopes to offer the airline industry — small airlines and travel agencies — one-stop shopping network services. The company will package airline reservation systems created by its parent company's technical division with any of a variety of voice and data network services. Net capacity will also be resold to other users and independent telephone companies.

Network services will include private-line, digital data and packet-switched services. Users' traffic will be carried over System One Telecommunications' all-fiber network, which is complete with Digi-

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Network World wants to make its news coverage even better, and for that we ask your help. If you know of an interesting event that just occurred or is about to occur, please call. We'd also like to know how you optimize your networks. Call Editor Bruce Hoard toll free at (800) 343-6474.

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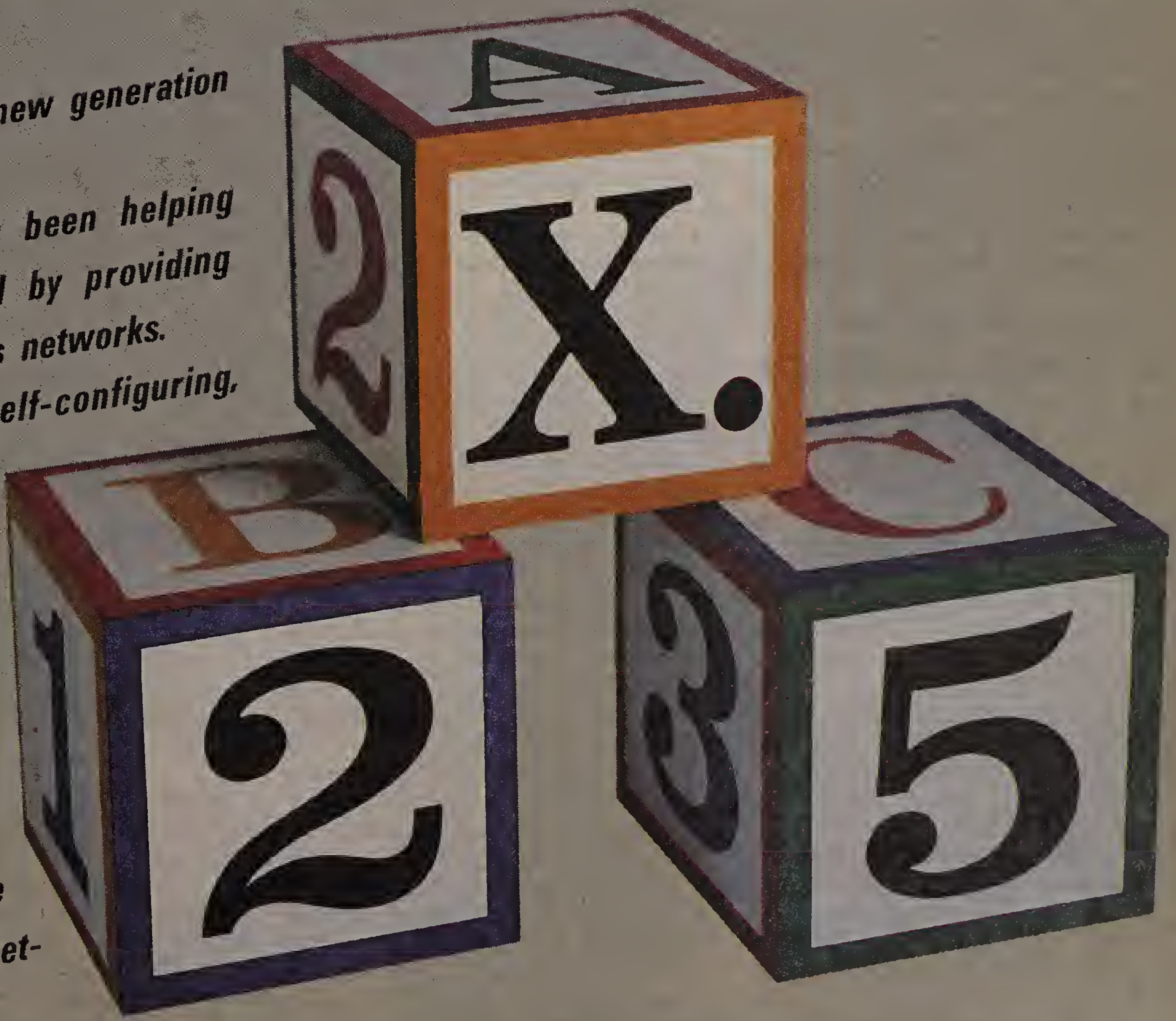

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▶ *ACQUISITION PLANS*

Mitel to grab RCA Tel

Move would provide direct sales link.

BY PAM POWERS
Senior Editor

BOCA RATON, Fla. — Responding to consolidation in the private branch exchange market, Mitel Corp. last week said it intends to acquire one of its largest distributors, the RCA Telephone Systems Business of General Electric Co.

The acquisition, if completed, would give Mitel its own direct sales channel and access to RCA Telephone's installed base of users.

Analysts applauded the move, saying the $226 million Mitel faces stiff competition from recently formed partnerships between Siemens Information Systems, Inc. and Tel Plus Communications, Inc. and between Vodavi Technology Corp. and ISOETEC Communications, Inc.

Mitel studies RCA

Mitel's nonbinding memorandum of intent permits the phone maker to examine RCA Telephone's operations with the intent to acquire the PBX distributor.

A profitable sales and service company with about 1,000 employees, RCA Telephone markets NEC America, Inc. and Hitachi America, Ltd. PBXs as well as Mitel's SX50, SX200 and SX2000. Mitel will not disclose what it might pay for RCA Telephone.

RCA Telephone officials will not disclose revenue or earnings figures for the division, but Paul Kirvan, principal with the Turnersville, N.J.-based consulting firm Paul F. Kirvan and Associates, estimated that the company has installed close to two million lines, making it one of the largest distributors in the country.

With RCA Telephone, 'Mitel will have the lead in terms of support capability," said consultant Paul Kirvan.

A Mitel spokeswoman said one of the primary reasons for acquiring RCA Telephone is that the distributor has a strong presence in the health-care and lodging industries, where Mitel has targeted its SX200 digital switch.

"This acquisition would also increase our ability to compete against major players targeting mid-sized users," she said. RCA Telephone would probably continue to sell the NEC and Hitachi product lines too, she said.

Greg Carlsted, an associate director for the communications industry service at Dataquest, Inc. in San Jose, Calif., agreed that the move is a smart one for Mitel. He said Mitel is already strong, accounting for about 25% of the market for PBXs with less than 100 lines (based on 1986 unit shipments).

Market consolidation

The recent consolidation of the PBX market has made it necessary for Mitel to pair up to remain competitive.

"RCA is a big Mitel distributor, and this is a defensive move on Mitel's part to prevent anyone else from acquiring its users. The acquisition would give Mitel direct control of its installed base, which it can cultivate for add-on sales."

Kirvan said that with RCA Telephone, "Mitel will have the lead in terms of support capability. This would put it in a league with Northern Telecom and AT&T."

From RCA Corp.'s perspective, the acquisition would represent another in a series of recent sales by GE. Since GE acquired RCA in January 1986, it has whittled away at RCA's diverse holdings in an attempt to get back to core businesses. Because GE may have been eager to rid itself of the division, Kirvan said, "Mitel probably picked up a great deal." ◘

Vendors unite to push standard

continued from page 2

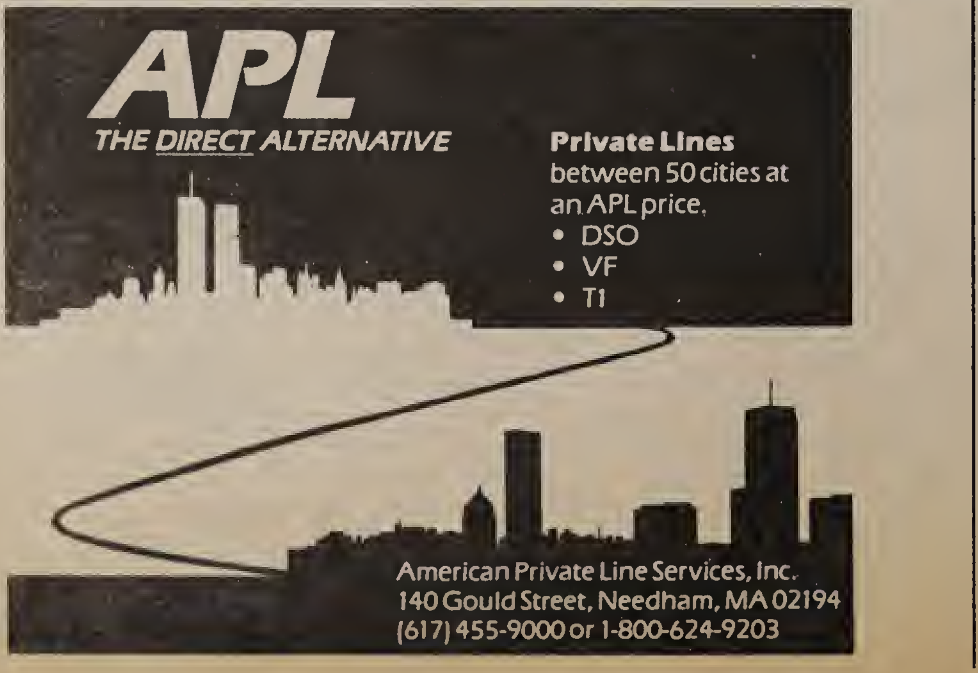
Dow admitted that improvements could be made to MNP's first compression technique, dubbed MNP Layer 5. Last week, Microcom announced a V.22bis modem incorporating a second technique called MNP Layer 7. The company claimed MNP Layer 7 compresses data at a ratio of 3-to-1, so a 2,400 bit/sec modem effectively transmits data at a rate of 7.2K bit/sec. MNP Layer 7 will be available to other vendors in 120 days.

MNP has garnered widespread acceptance. Microcom pointed out that the MNP protocol is endorsed by 41 modem manufacturers and currently runs on more than 400,000 modems. There are two types of endorsements.

Layers 1 through 4 are in the public domain and available to vendors at no cost. Vendors can license Layers 5 and 6 from Microcom for $2,500.

Racal-Vadic and UDS said few vendors licensed MNP Layers 5 and 6, so there is no clear leader for data compression. Dow estimated that between one-third to one-half of the modems with MNP support Layers 5 and 6. Concord Data Systems plans to offer customers both MNP Layer 5 and ACT.

Bowing to MNP's entrenched base, the trio noted that ACT's compression technique supports MNP protocols from Layers 1 through 4. A customer could connect a UDS modem to a Microcom modem. However, the modems would operate at a speed of 9.6K bit/sec and could not use any type of data compression. ◘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▶ *TWISTED-PAIR ETHERNET*

UB unveils Access/One

Links workstations with phone wire.

BY JOSH GONZE
Senior Writer

NEW YORK — Barreling into the nascent market for Ethernet-over-nonshielded twisted-pair wiring, Ungermann-Bass, Inc. last week unveiled a product that links workstations over common telephone wire and provides a gateway to token-ring networks.

The product, dubbed Access/One, consists of a cabinet placed in a wiring closet and a set of boards, called modules, that enables communications between workstations at the conventional Ethernet rate of 10M bit/sec over nonshielded twisted-pair wire. The modules support asynchronous and 3270-type terminals, microcomputers, hosts and other network devices.

Users on the Ethernet network can communicate with users on a token-ring network via a dedicated module that supports up to 20 token-ring workstations. The stations can be daisy-chained to form larger rings, providing support for up to 220 token-ring workstations.

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▶ *IBM CONNECTIVITY*

Apple to unveil LU 6.2 gateway for Macintosh

BY JIM BROWN
New Products Editor

CUPERTINO, Calif. — Apple Computer, Inc. is expected this week to announce a gateway enabling its Macintosh microcomputers to access IBM Systems Network Architecture environments using LU 6.2 protocols.

MacAPPC is a hardware and software product. It enables Macintosh applications supporting IBM's Advanced Program-to-Program Communications to use LU 6.2 to access other APPC-compatible applications running on other processors.

The two-piece MacAPPC supports a client/server architecture. APPC applications running on Macintosh Plus, Macintosh SE and Macintosh II microcomputers are clients that link via an AppleTalk network to a Macintosh II outfitted with a MacAPPC board.

Apple will provide application developers with client software modules they can integrate into Macintosh applications. Those modules detect requests for LU 6.2 services and establish the necessary link to the MacAPPC board transparently.

That board, which runs sna 62 Peer Communications Facility software licensed by Apple from Orion Network Systems, Inc., acts as a server and supports LU 6.2 protocols needed to link the Macintosh to the SNA network.

The client/server approach differs from the way IBM implements APPC on its Personal Computers, according to Don Czubek, president of Gen2 Ventures, a consulting firm in Saratoga, Calif. With IBM, each Personal Computer seeking access to host-based APPC applications is required to run a full implementation of LU 6.2 software.

Conversely, the client/server architecture frees Macintoshes on AppleTalk networks from having to support a full LU 6.2 implementation because most of the LU 6.2 communications code runs on the MacAPPC board, Czubek said. "That is the kind of configuration most of the big MIS shops we've talked to have been looking for," he said.

The MacAPPC announcement is in keeping with Apple's recent focus on providing connections to larger systems, said John Carosella, a consultant with Network Strategies, Inc. in Fairfax, Va. "Apple has gone from having very little recognition for their connectivity abilities to leading the personal computer business with this kind of a gateway," he said.

Czubek also said that increased connectivity will help Apple crack into more corporate accounts. "The one thing that has really been lacking, as far as the Macintosh's use in large organizations is concerned, is good IBM communications support," Czubek said. MacAPPC is a good initial step in correcting that fault, he added.

However, because the new product requires programmers to write applications supporting LU 6.2, it may be a few years before end users actually see productive applications. "Two years down the road, this will be an important product," Carosella said.

Czubek agreed that it will take time before the applications appear on the market, but, he said, "there should be certain generic applications like electronic mail and remote file access that users can use without having to develop their own applications."

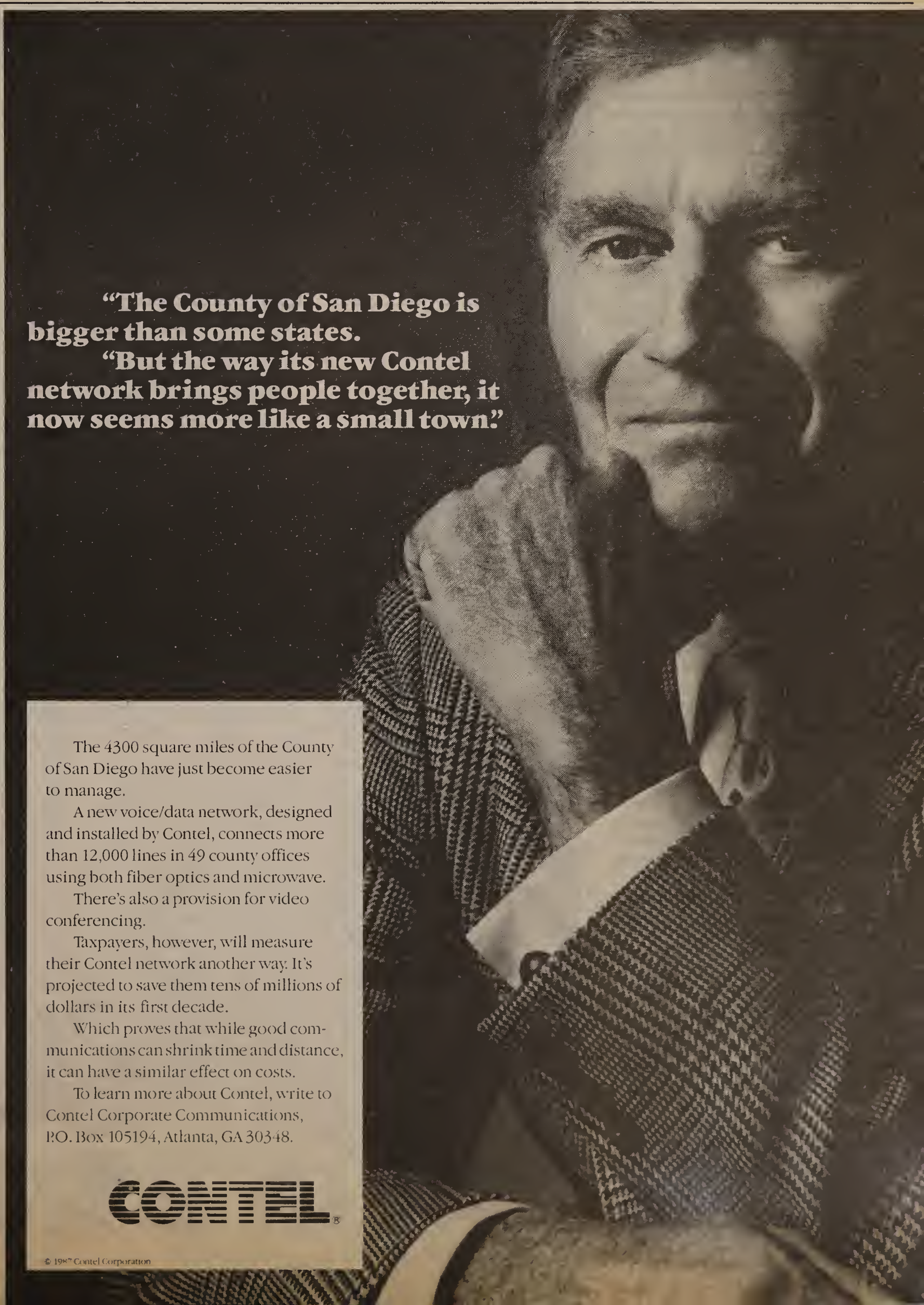
Apple is also expected to announce a software tool kit that enables programmers to insert Macintosh screen presentation services into host-based applications.

MacWorkstation enables host applications designed to support the Macintosh to convert the typical screen presentation that hosts use to the Macintosh screen format. This saves Macintosh users from having to be retrained in order to use host-based applications.

Also expected to be introduced is an enhanced version of AppleTalk for VMS, which links AppleTalk networks to Digital Equipment Corp. VAX minicomputers running under VMS. AppleTalk for VMS enables VAX resources such as disk storage space and VAX applications built to work with Macintoshes to appear to a Macintosh as virtual AppleTalk nodes.

The software only enables the VAX to support AppleTalk protocols. VAX applications capable of working with the Macintosh will still need to be developed.

AppleTalk for VMS is being introduced two weeks after DEC and Apple announced they would jointly develop products to link Macintoshes and AppleTalk nets to DEC. VAXes ("Apple and DEC camps unite," *NW*, Jan. 18). ☑



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UPCOMING CONFERENCE

ENE '88 to highlight MAP/TOP

Products based on V 3.0 to be tested.

BY MARY PETROSKY
Senior Correspondent, West Coast

LONG BEACH, Calif. — Sponsors of the Enterprise Networking Event '88 International (ENE '88) last week released details about their upcoming conference, promising it will be the largest interoperability test to date of products based on MAP and TOP.

The highlight of ENE '88 will be a networking demonstration showcasing communications products based on Version 3.0 of the Manufacturing Automation Protocol/Technical and Office Protocol. Approximately 50 vendors will participate, including major U.S., European and Japanese companies.

ENE '88 sponsors, vendors and participating organizations are expected to spend more than $50 million to stage the event.

The U.S. MAP/TOP Users Group and the Corporation for Open Systems (COS) are cosponsoring the conference, scheduled to begin June 5 at the Baltimore Convention Center. About 15,000 attendees are expected.

ENE '88's sponsors talked about the conference at a meeting prior to the MAP/TOP Users Group meeting here. They said it will highlight the coming of age of the Open Systems Interconnect (OSI) standards. MAP and TOP are networking specifications based on the OSI model.

"We see ENE increasing the understanding of what OSI can provide and giving clear evidence to users that there are products coming out," said Lincoln Faurer, president of COS.

Enterprise networking emphasis

The name "Enterprise" was chosen for the event in order to emphasize that MAP and TOP together can address a company's enterprisewide networking needs, Faurer said.

ENE '88 will consist of a series of nine networked booths set up to imitate a real company. To add realism to the demonstration, pen and business card holder sets — the fictional company's product — will actually be produced.

Computer and manufacturing equipment in each booth will perform functions such as order entry, manufacturing resource planning and manufacturing design typically done in industrial companies. Communications with outside suppliers will also be demonstrated.

Sponsors of these booths and the business functions to be demonstrated cover a wide range. Boeing Computer Services Co. will demonstrate order entry, and TRW, Inc. will handle manufacturing planning. The U.S. Air Force/Industry Coalition will provide a manufacturing design demonstration. Deere and Co. will exhibit just-in-time manufacturing, and the British Department of Trade & Industry will act as the supplier.

Also acting as supplier will be a Europeanwide project managed by British Aerospace at a plant in England. Alcoa and other companies in process industries will exhibit energy planning and material processing. COS will demonstrate invoice, and General Motors Corp. will offer an assembly show.

ENE '88 will include sessions about manufacturing automation

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Washington Update

BY KARYL SCOTT
Washington, D.C. Correspondent

MCI Communications Corp. last week announced long-distance rate reductions totaling $135 million. The 3.5% rate cut matches reductions announced by AT&T on Jan. 1 and results from decreases in local access costs.

MCI Dial 1 service rates will go down approximately 4%. Rates for MCI's Prism I, II and III services will be cut an average of 4.7%, and rates for Prism Plus will go down an average of 4.8%. Vnet service will be cut about 7%, and MCI 800 service rates will be reduced an average of 3.5%.

MCI will increase rates for voice-grade, private-line service by 2% on average, but most increases will occur on circuits of fewer than 200 miles, the carrier said.

MCI plans to file the new rates with the Federal Communications Commission this week. If the FCC approves the tariff filing, the new rates will take effect March 1.

US Sprint Communications Co. is expected to announce similar rate cuts, although a company

spokesman said no date has been set as yet.

Meese investigated

Attorney General Edwin Meese is under investigation for possible ethics violations in connection with his ownership of $14,000 worth of regional Bell holding company stock.

Independent counsel James McKay is investigating whether Meese violated federal conflict-of-interest laws in meeting with RBHC officials and in approving U.S. Department of Justice recommendations to free the RBHCs from divestiture decree restrictions while holding stock in the seven companies. Justice Department criminal investigators, who conducted an initial investigation into Meese's activities, turned the case over to the independent counsel in late December.

Meese sold his RBHC stocks in the second half of last year, after Sen. Howard Metzenbaum (D-Ohio), chairman of the Senate Antitrust Subcommittee, forced Meese to reveal details of his financial interests in the RBHCs.

RBHC allegations

Congressional sources revealed last week that three RBHCs allegedly received proprietary bid information from U.S. General Services Administration officials in connection with a $55 million telecommunications procurement.

Senate Governmental Affairs Committee Chairman John Glenn (D-Ohio) said in a statement issued last week that officials of the C&P Telephone Co., Southern Bell Telephone Co. and an as-yet-unnamed Bell operating company received confidential pricing information on AT&T's bids for Federal Telecommunications System (FTS) service contracts. Eleven FTS contracts were awarded to AT&T and to four RBHCs to upgrade the existing FTS.

Glenn alleged that C&P and Southern Bell officials admitted to receiving proprietary bid information.

A spokeswoman for BellSouth Corp., the parent company of Southern Bell Telephone, said the company was conducting an internal investigation of the matter but declined further comment on Glenn's statement.

Bell Atlantic Corp. President Raymond Smith said he was "outraged by Glenn's allegations. The information released by the senator is misleading and distorted," he said. "Bell Atlantic did not solicit information or meet with GSA officials to obtain information on competitors' bids."

The GSA recently revealed that Sureshar Soni, head of the GSA's network design division, is under investigation for allegedly meeting with RBHC officials during the FTS bidding process and leaking sensitive bid information to AT&T's competitors.

Other GSA officials are also reportedly under investigation, but their names have not been released. Soni has been reassigned to another division, pending conclusion of investigations being conducted. ◪

INFORMATION SERVICES

Response mixed on NTIA plan

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Industry and users groups were split last week over the U.S. Department of Commerce's recommendation that the regional Bell holding companies be allowed into the information services business.

The recommendation, issued last November by Alfred Sikes, director of the National Telecommunications and Information Administration (NTIA) — a division of the Commerce Department — would require the Federal Communications Commission to issue a ruling permitting the RBHCs to market information services.

The RBHCs are currently barred from selling information services under the 1983 Modified Final Judgment. That court ruling limits the RBHCs' activities to the provision of local telephone services. The FCC asked for public comment on NTIA's recommendation.

Many legal experts say the action would put the federal regulatory agency on a collision course with U.S. District Court Judge Harold Greene, who oversees the Modified Final Judgment.

The National Telecommunications Network (NTN), a consortium of regional fiber-optic carriers, cautioned the FCC about becoming involved in NTIA's mischief making. The consortium said NTIA is asking the FCC "to do something that is clearly beyond its statutory authority. The FCC has repeatedly recognized that it does not have the statutory authority to override determinations of the antitrust laws," according to NTN's comments.

See page 69

What ISDN is doing for McDonald's data networking capabilities is no small potatoes.

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"In business language, this means we're going to do an even better job for the 30 million customers that we serve every day," said Bonnie Kos, McDonald's Vice President of Facilities and Systems.

"ISDN provides an information outlet to every workstation, thereby eliminating time-consuming and costly wiring, as well as enhancing messaging and network control capability."

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HP allies with Codex, NTI

continued from page 1

The alliances enable HP to compete with IBM's Enterprise Marketing Program and Unisys Corp., which recently purchased communications provider Timeplex, Inc. "In the new world, vendors need all-encompassing product lines," said Larry Cynar, an analyst at Dataquest, Inc., a San Jose, Calif., market research firm. "Suppliers will not survive by selling a few pieces of a network system. It almost goes without saying that computer companies must have comprehensive networking strategies that include data and voice communications equipment."

Historically, computer manufacturers and communications vendors cooperated on an ad-hoc basis to furnish customers with network systems. In the last few years, computer manufacturers have seen the need to integrate their systems more closely with communications vendors' equipment.

"Vendors can no longer simply sell customers a 9.6K bit/sec modem," Cynar said. "They also have to supply the application used by the modem."

Computer manufacturers and communications vendors are teaming up to develop customers' turnkey applications, consisting of communications equipment application software and computers.

Willem P. Roelandts, general manager for HP's Information Networks Group, said no vendor, not even IBM, has a product line broad enough to meet every need.

"HP's weaknesses are voice networking and integrated voice and data networking," he said. "We are looking for strategic partners to help us in those areas." Roelandts acknowledged that HP has marketing agreements with Codex and Northern Telecom but would not provide details about the arrangements.

Mark Davies, vice-president and general manager of wide-area network products at Codex, verified that the two companies have a strategic marketing agreement. Davies said HP and Codex have jointly called on and sold products to large customers but declined to name the customers.

Analysts speculated that HP and Codex are working on new products, such as support for X.25 connections over multidrop lines. Both companies declined to comment on their product plans.

The HP alliances will put pressure on Digital Equipment Corp., according to analysts. "DEC views communications as a local connection," Cynar noted. "The company has done little to enhance its wide-area network capabilities, and that's the area where customers are looking for solutions."

Analysts were divided on how well HP would fare against IBM and Unisys. Jack Freeman, senior analyst at The Yankee Group, a Boston-based market research firm, said the agreements fill significant gaps in HP's product line.

Northern Telecom, which also has a marketing agreement with DEC, brings voice capabilities to the table, and Codex's multiplexer, modem and network management lines are among the industry's best, according to Freeman. The company also has an OEM agreement with StrataCom, Inc. for its Integrated Packet Exchange T-1 multiplexer, which HP uses within its internal network.

Dataquest's Cynar said, "Codex has been doing quite well positioning itself as a networking company. Only IBM and AT&T are in a better position to offer customers complete network systems. Codex doesn't really gain anything by aligning itself with HP."

Whether or not the alliances will add to the three companies' coffers is questionable. Freeman said the suppliers will have to offer customers value-added features such as integrated network management. If the three vendors develop common links to their network management systems, customers would be able to control voice, data communications and computer equipment from a single terminal.

Such an event seems likely. HP was one of the first vendors to abandon a proprietary network architecture for support of the International Standards Organization's Open System Interconnect (OSI) model. The company said it will develop network management products based on the OSI model.

Northern Telecom has also pledged support for the standard. Last fall, Codex announced a network management architecture that conforms to the OSI model.

Cynar said another issue is how the three companies' salespeople will respond to the alliances. "HP salespeople will have to learn data communications and voice communications, which is not an easy task," he said. "Some salespeople may not think it's worth the effort, because the end result may be a few more modem sales."

HP's Roelandts admitted that alliances require management direction. He said HP can work with only a handful of partners and would limit its agreements to fewer than 10 companies. ☑

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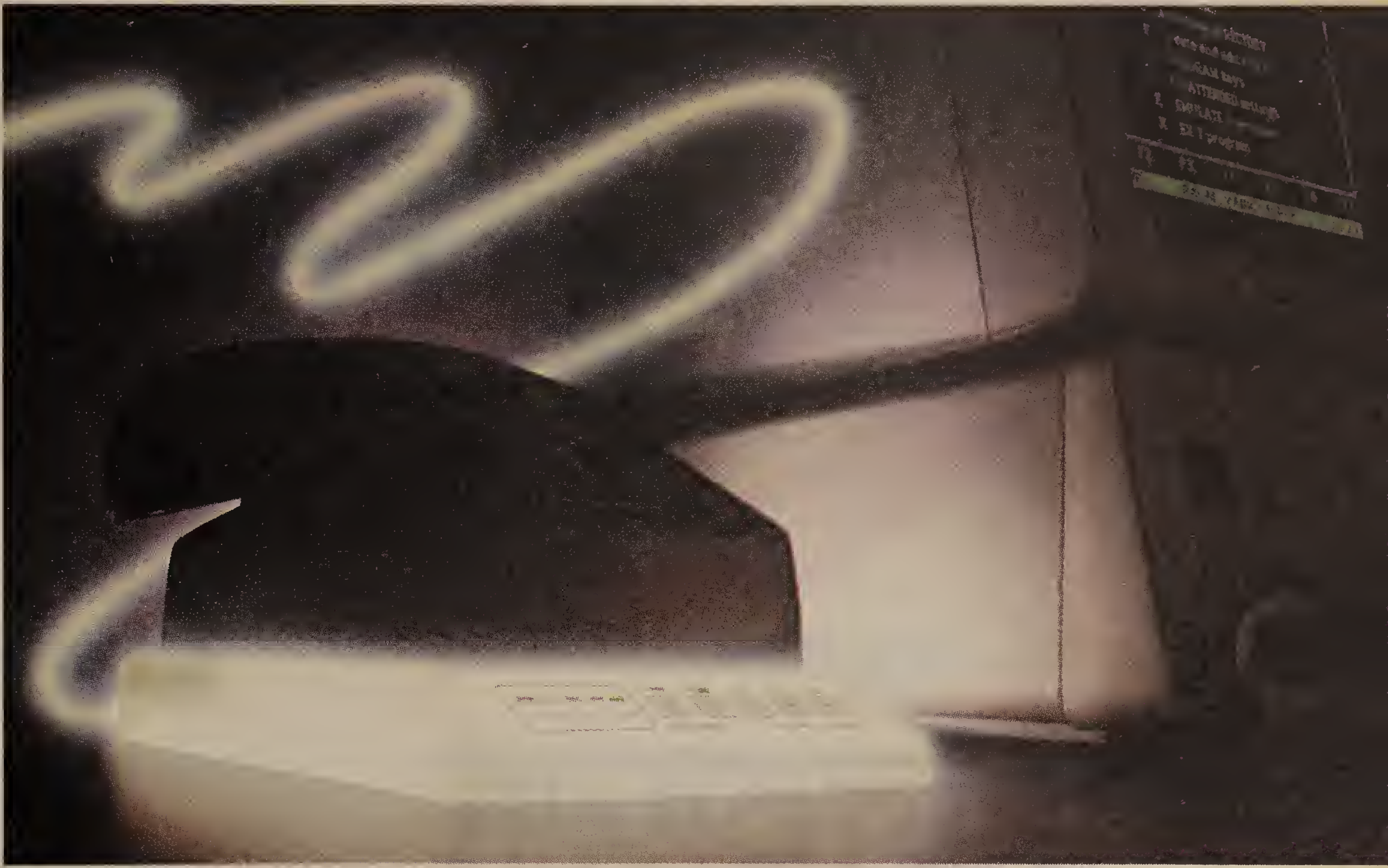

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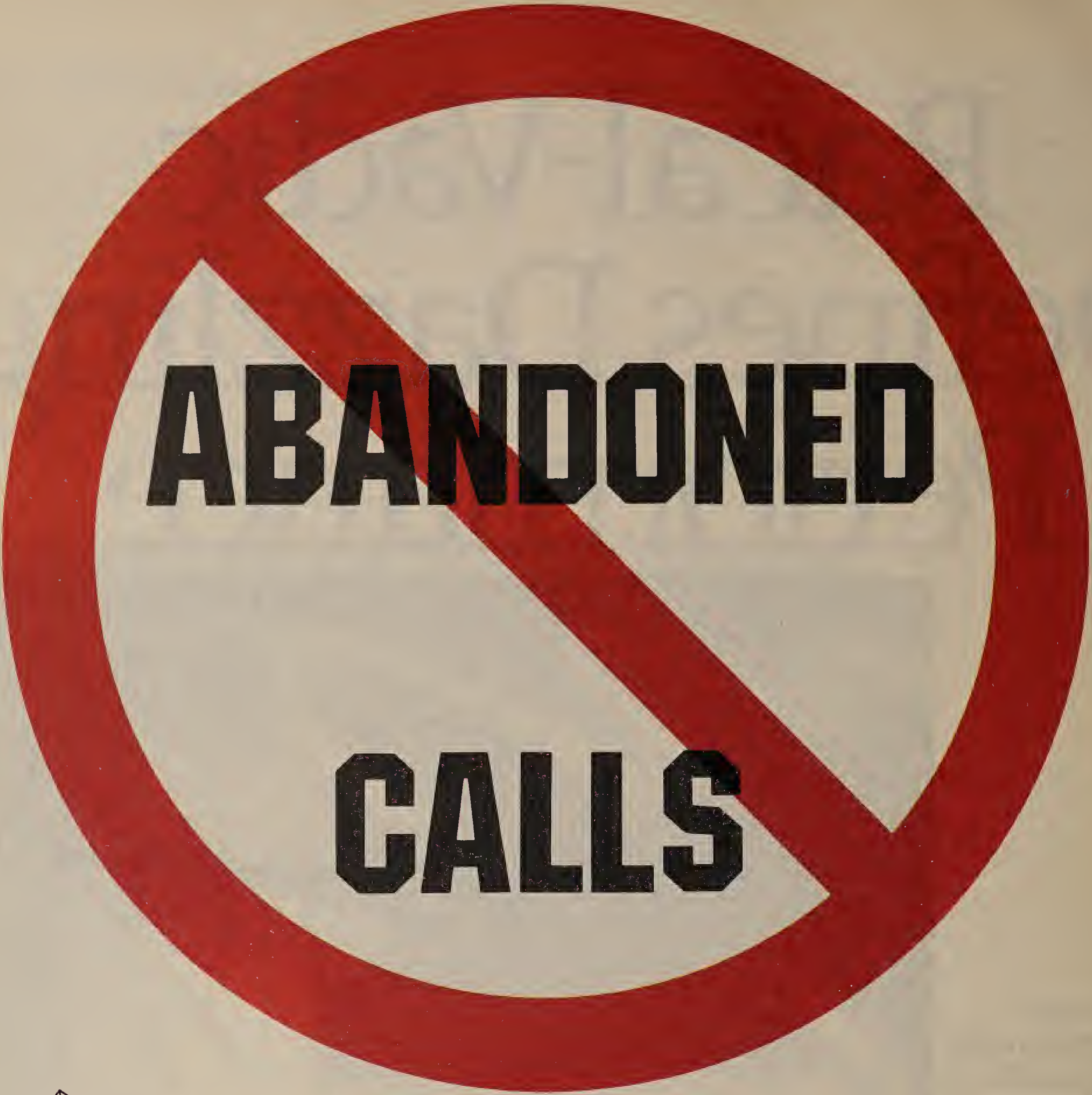

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INDUSTRY UPDATE

BBN to provide System One packet net

BBN Communications Corp. was awarded a contract for a packet-switching network to support the fiber-optic network of System One Telecommunications, the division of Texas Air that operates the airline's reservation system. System One, which serves more than 100 airlines, will also market packet-switching services over the network to end users.

CORPORATE RESTRUCTURING

COO Amman set to revamp WU

Western Union splits into five units.

BY PAM POWERS
Senior Editor

UPPER SADDLE RIVER, N.J. — Western Union Corp.'s newly elected chief operating officer, Robert Amman, has begun a company reorganization that could trigger layoffs and the sale of certain businesses.

Amman said his goal in organizing Western Union into five new business units is to determine where the company can achieve profitability and where it should exit from nonprofitable businesses. He hopes to push the company into the black by 1989.

In December, Western Union managed to pull off a massive restructuring proposed by investor Bennet S. LeBow. The plan involved the merger of Western Union into its operating subsidiary Western Union Telegraph Co.; a $25 million investment by LeBow's firm, which would gain control of the company; and the acquisition of ITT World Communications, Inc. (ITT WORLDCOM), ITT Corp.'s international Telex subsidiary, which is now being merged with Western Union's Telex operations.

The changing of the guard at Western Union has put Amman, an associate with New York-based LeBow and Associates, in charge of the company. Shareholders approved his appointment as chief operating officer in a vote two weeks ago.

Amman, with little experience in the telecommunications industry, has ambitious plans for Western Union. In reports published last week, Amman is quoted as saying Western Union may lay off 500 to 700 employees to reduce staff redundancy with ITT WORLDCOM, and it may sell off the company's long-distance net.

In a phone interview last week, Amman would say only that he is considering those options but that no decisions concerning layoffs or the sale of business units have been made. "We have a lot of work to do to be profitable by 1989," he acknowledged.

The work begins with an internal restructuring that will divide the company into five strategic business units, the largest of which will be called Business Communications Services. Included in that will be Western Union's and ITT WORLDCOM's combined Telex operations, and Western Union's EasyLink electronic mail business.

Both Western Union's and ITT WORLDCOM's Telex revenues declined in 1986, as compared with 1985, and also during the first nine months of 1987, as compared with the similar period in 1986. In a proxy statement issued in December, Western Union summed up the Telex dilemma: "Overall use of international Telex is declining, but not as rapidly as domestic Telex."

In an effort to cut costs and operate the businesses more effi-

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INDUSTRY EYE
PAM POWERS

Micom faces an uphill battle

Micom Systems, Inc.'s move into the T-1 and packet-switching networks business is critical to the company's future. But its timing, coupled with its image in the market, will be impediments to Micom's attempts to sell itself as a networking vendor.

Last week, Micom announced its Blueprint networking scheme, which represents an effort to sell its product line as a systems solution to medium-sized users. That product line now includes the Spectrum Digital Corp. T-1 multiplexer and an Amnet, Inc. packet switch that Micom will sell through an OEM agreement.

Micom has taken great strides to expand its product line to address current customer demands, but it has created its own handicap by staging a tardy entry into both the packet-switching and T-1 arenas. That lateness has contributed to the popular belief that Micom is an equipment vendor.

Users know Micom is adept in the world of data private branch exchanges and statistical multiplexers, but does that mean it can design and support sophisticated wide-area networks? Micom's image will be a millstone around its neck as the company attempts to sell systems.

For Micom, there are some fundamental differences between selling a data PBX or statistical multiplexer to an installed base that sees Micom as a components company and selling a T-1 or packet-switching system to that same installed base.

When the company attempts to reach outside its own pool of customers, it will again confront the public perception that it is a maker of discrete communications products.

Given that Micom already faces difficulties with its image, its decision to ally itself with Amnet and Spectrum Digital — each an underdog in its respective market — is problematic.

The Amnet name is virtually unknown in the world of packet switching, where the company holds a negligible share of the market. Spectrum Digital, on the other hand, has achieved a dubious sort of recognition that is more aptly described as notoriety.

Since its inception, the company is known to have been plagued by financial problems and late product delivery, all of which contribute to an image that will only exacerbate, not alleviate, Micom's own image problems.

Micom's tardiness in entering the T-1 multiplexer market places it, as a newcomer, against some truly formidable competition. Micom would hasten to remind you that arriving late to a market doesn't necessarily spell disaster.

After all, the company did not scramble headlong into the data PBX or statistical multiplexer markets. Instead, it staged a grand entrance at a late hour and has since won a leading share in both of these markets.

However, by making its en-

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INTERNATIONAL NEWS

IBM finds friends in Europe

Strategic alliances show policy shift.

BY AMIEL KORNEL
AND ANNE-MARIE ROUZERE
IDG News Service
European bureau

PARIS — In Europe, 1987 may be remembered as the year IBM started weaving its blue thread through the European corporate community. In a major policy shift, the U.S. computer maker has begun a wide-ranging program of partnerships with other high-technology companies.

Among its recent alliances in the communications industry, a market in which IBM appears to be making a big push internationally, are deals with Siemens AG in West Germany, the Spanish Post, Telegraph and Telephone administration Cie. Telefonica Nacional de Espana, and Ericsson in Sweden.

"It's a new aspect of its policies," said an official closely involved in monitoring IBM's activities at the European Community's (EC) headquarters in Brussels, Belgium. "IBM no longer presents itself as a monopoly."

Of course, as one of Europe's major employers and taxpayers, IBM already is closely tied to European economies. And the firm, trying to project a good citizen image in nationalistic markets, already participates in joint basic-research projects with local firms and academic institutions. But until last year, the U.S. giant had entered into few commercial and technological agreements with European firms.

"Even if we always practiced partnerships, it's true that we had a tendency to go about our business in an isolated manner," said Rene Russo, manager of industrial cooperation at IBM France. He added that IBM management now wishes to "break out of this isolation . . . Playing the prima donna and not doing business is absurd."

In addition to traditional ties to its suppliers and distributors, IBM in Europe has formed alliances with tire makers, banks, machine builders, telecommunications operators, car makers, software and services companies, and building contractors, to name but a few. Although an exhaustive taxonomy of

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IBM finds friends in Europe

continued from page 11

IBM's business partnerships would challenge the periodic table of elements for complexity and variety, even an incomplete description affords a glimpse of the intricate fabric being woven.

IBM's push into systems integration is one example of a new business activity spurring a number of short-term partnerships. Seeking to win bids for commercial opportunities where multivendor systems are involved, IBM readily forms temporary alliances with local companies that can offer specific expertise.

Internally, IBM dedicated more than 600 people to its systems integration activites in Europe last year, while more than 800 others work in product development centers writing applications software to meet specific client needs.

Telecom's growing role

The growing role of telecommunications in information processing and distribution has also become a driving force behind IBM's surge in alliances.

Although it probably has the expertise and resources necessary to succeed on its own in this area, IBM's telecommunications strategy seems to rely on forming partnerships. The accords with Ericsson, Siemens and Spain's Telefonica were announced in recent months.

While IBM officials insist the alliances are synergistic with its partners, the arrangements also seem motivated by a desire to deflect criticism as the giant increases its presence in European markets.

"IBM has the means in Europe to do a number of things alone and impose its control," said the EC official. "But having European partners is rather antimonopolistic, a little less bad."

Nonetheless, IBM must refrain from creating exclusive partnerships that could seem anticompetitive, he warned. "We look at each agreement with interest to see what it can mean for competition in Europe."

This antitrust scrutiny imposes certain constraints on IBM's partnership policy. For example, on a single day in October, IBM announced separate agreements concerning intelligent networking projects with Siemens and Bell Atlantic Corp. of the U.S., while its two partners simultaneously announced their own agreement.

Asked why the companies didn't simply announce a three-way accord, Tim Campbell, director of operations at Bell Atlantic, said, "A multinational company like IBM is limited in the way it can do business." Often, teaming up with a local firm enables IBM to increase its presence in a country that may otherwise resort to protectionist barriers.

"IBM is trying to give a better image of itself, a good-guy image," the EC official said.

This month, for example, IBM France is passing control of its nationwide client services network to a joint telecommunications venture recently created with three French banks — Paribas, Credit Agricole and Credit du Nord — and a French software and services company, Sema-Metra.

Called Axone, the new firm's activities will center on the provision of value-added network (VAN) services such as teleprocessing backup and interconnection of multivendor messaging systems.

Axone's partners will reportedly invest $109 million, 45% coming from IBM France, during the next five years. The staff is expected to grow fourfold, from its current level of 100, by 1992, according to Gerard Jousset, one of the company's two managing directors.

Improving access to Europe

Cynics are already saying the joint venture aims to let IBM enter France's nascent VAN business under the cover of a separate company. But Jousset, while acknowledging that he is still on the IBM payroll, insisted, "We are not a division of IBM."

In Italy, IBM's joint ventures with Selenia-Elsag, a unit of the state-controlled industrial holding IRI-Stet, and automaker Fiat, Italy's largest private company, seem at least in part aimed at improving access to the Italian market. In what was its first joint venture agreement in Europe, IBM and Selenia-Elsag have been developing computer-integrated manufacturing systems together since 1984. The Fiat co-venture, started last March and called Intesa, concentrates on developing value-added services for the automotive industry.

Similarly, by teaming up to develop a VAN with Telefonica, Spain's state-run telecommunications operator, IBM has secured a partnership with the country's biggest information-technology firm.

Another trait common to many of IBM's European alliances is that the partners themselves offer ready-made markets for the new firms' business. In the case of Axone, IBM France and Paribas are the new venture's first major clients. In Italy, Fiat's industrial empire represents big business for Intesa.

Although IBM's push for partnerships has not quieted the concerns of critics who fear the computer maker has become too dominant a force in the marketplace, its partners seem eager to benefit from the U.S. giant's commercial and financial muscle.

Asked if Ericsson had any fears about linking up with IBM, John Meurleng, vice-president for business development at Ericsson Telecom, replied, "It's better to join them than to fight them."

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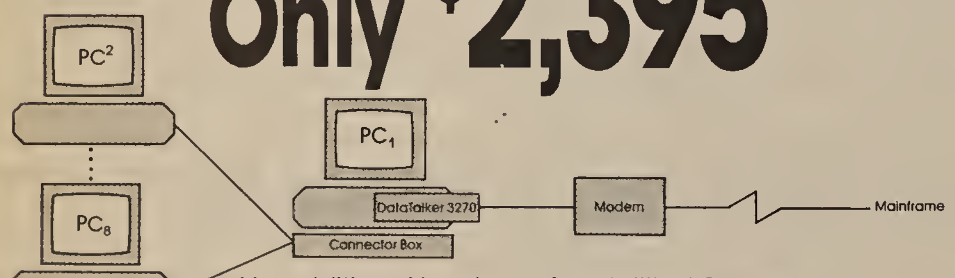

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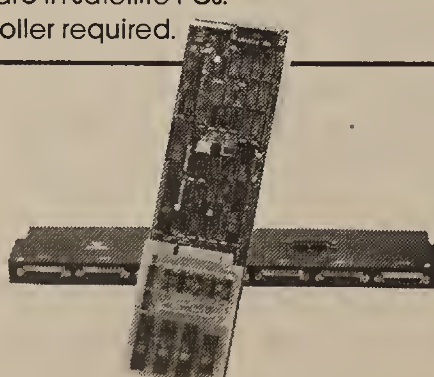

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COO Amman set to revamp WU

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ciently, Amman said a team has been established to integrate the two Telex businesses and the EasyLink operation. "We certainly expect some layoffs and have done some preliminary studies as to what those might be, but we really won't know [how many] for another 60 days," he said.

Despite the prognosis for Telex, Western Union anticipates considerable growth in this unit through the introduction of more value-added services based on EasyLink. "In the future," Amman said, "we will not provide just a commodity electronic mail service, but rather, specific solutions for vertical markets."

Amman cited banking as a vertical market the company is considering, and he said the firm is also considering entering the electronic data interchange market.

The second largest business unit will be Consumer Communications and Financial Services, which will include Western Union's money transfer, mailgram and telegram services marketed to consumers. Amman said this operation has a network of more than 10,000 agents throughout the country.

"That's the largest existing agent network for these kinds of services. We think that represents a great opportunity to develop new services, and we'll focus on that." Amman said the consumer services would be value-added, but he would not elaborate on those plans.

Network Services, the third largest unit, will combine the company's long-distance voice services, private wire services and some of the maintenance services the company provides. While Amman retreated from earlier statements that he would sell off the long-distance unit, he said, "We are exploring [that possibility]. No decisions have been made. But we're not going to stay in any business that we cannot be profitable in."

Western Union's proxy describes the long-distance business as "highly competitive and characterized by declining prices and profit margins."

A fourth business unit, Priority Mail Services, will operate the company's mailgram services for high-volume users. Typical high-volume mailgram applications include product recalls and proxy fights, Amman said.

The final unit, which Amman said is small today but has great potential, is named Advanced Transmission Systems. Amman described it as a construction business, in which Western Union will make use of its extensive ownership of rights-of-way in major metropolitan areas to lay local fiber-optic cable.

"Our rights-of-way are an asset we need to explore. Although, quite honestly, it doesn't generate much revenue now," he said, "this is something that could be a real opportunity for the company."

EARNINGS

Network Equipment Technologies, Inc. (NET) reported a 73% rise in fiscal third-quarter revenue and a 135% rise in income over the similar period last year. Revenue totaled $24.79 million, as compared with $14.25 million last year. Earnings grew to $3.98 million as compared with $1.73 million last year. Income reflects a $559,000 tax credit.

During the quarter, the company shipped its first IDNX/20 to a customer site, The Travelers Corp. in Hartford, Conn.

Digital Equipment Corp. posted a 22% increase in revenue, to $2.78 billion, up from $2.27 billion for the company's fiscal second quarter, ended Dec. 26, 1987. Earnings were also up 22% for the quarter, to $329.5 million, as compared with $269.9 million a year ago.

DEC Vice-President of Finance James Osterhoff said the company has kept to an aggressive growth plan for the year but that uncertainties in the economy have made DEC more cautious regarding new investment commitments for the second half of its fiscal year.

IBM's income rose 50% to $2.09 billion, as compared with $1.39 billion for the fiscal fourth quarter last year. Quarterly income was positively affected by a tax benefit and the sale of Intel Corp. stock. Revenue increased 6% to $18.01 billion, up from $16.95 billion during the similar period last year. Analysts were disappointed with IBM's earnings results, noting that without the special charges, income would have fallen for the third consecutive year.

Digital Communications Associates, Inc. reported record earnings of $9.6 million, or a 10% increase, as compared with $8.7 million for its second fiscal quarter, ended Sept. 30, 1987.

The company also achieved record revenue of $54.8 million, up 19% over last year's $46.1 million. Chairman and Chief Executive Officer Bertil Nordin said the T-1 multiplexer business has grown significantly.

Corvus Systems, Inc. kept to a plan of reversing its downward trend in earnings, posting a profit for its fiscal second quarter 1988. Revenue dropped, however, to $7.64 million, as compared with $9.9 million for the period ended Nov. 30, 1986. Profit rose to $2.99 million, as compared with last year's loss of $1 million. Commenting on the drop in revenue, President and CEO Lewis Lipton said, "Although revenue for the quarter dropped 23%, that's an expected result of our strategic decision to focus on more profitable products."

Micom faces an uphill battle

continued from page 11

trance at the eleventh hour into a market already overrun with full-fledged systems vendors, Micom's ill-timed arrival merely serves to exaggerate its peculiarities. And if Micom's assimilation of Micom-Interlan, Inc. is any indication, it will be some time before Spectrum Digital operates smoothly as a Micom subsidiary.

In the meantime, Micom's well-heeled competitors will continue to gobble up the available customer base for T-1 systems.

Despite these gloomy observations, Micom has shown surprising resiliency for a company to which many analysts gave last rites years ago. The first evidence of trouble turned up in fiscal year 1986, which ended March 31, 1986. The company posted plunging earnings, down from $25.7 million the previous year to $10.8 million. Income dipped again in fiscal 1987, to $2.65 million, although revenue grew to $198.6 million, as compared with $189.5 million in fiscal 1986.

Last week, however, the company reported an 11% increase in both earnings and revenue for its third fiscal quarter, contributed largely by Micom-Interlan product sales and the usually strong Black Box Corp. subsidiary. The numbers tell a tale of last-minute escape: In the nick of time, Micom found a new source of revenue in Interlan while declining demand for statistical multiplexers and data PBXs gnawed steadily away at its bottom line.

Micom's relationships with Spectrum Digital and Amnet smack of the same Indiana Jones-style management. While dangling over the snake pit, someone conceives an idea for a daring and brilliant escape that works, despite the seemingly insurmountable odds.

However, under such circumstances, maybe the means used to achieve the end are of little significance. Micom may very well hit the ground running with its T-1 and packet-switching systems sales. It has a large installed base to sell to, and the company reports it has steadily built up a sales force that is experienced in selling networks.

Moreover, while the Amnet and Spectrum Digital alliances do little at this point to enhance the Micom name, they do provide the company with two strong product technologies. Micom intends to sell both switches as products that offer high-end features at realistic prices for the mid-range user.

In so doing, the company has made the largest and most-ignored group of users its strategic target for network sales — a savvy move that will give them a start on much of the competition, which still targets high-end users.

As Micom acknowledges, the competition won't ignore an obvious growth market at the mid-range, and so it will shortly start encroaching on Micom's potential networking user base. But perhaps by then, the company will have established itself as a networking vendor in its own right.

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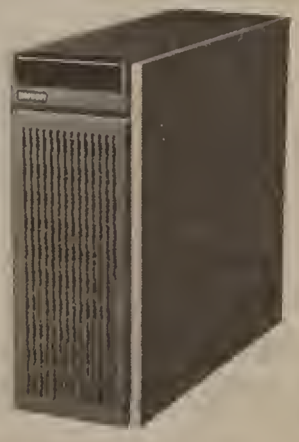

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> President of US Sprint Communications Co.
> Speaking about the carrier's introduction
> of Clearline T1.5 service

CROSS TALK
BOB WALLACE

AT&T bias still plagues US Sprint

Despite introduction of new services and enrollment of new customers, US Sprint Communications Co. is still struggling with billing problems and customer troubles created by local exchange carriers' favoritism toward AT&T.

Here's a glimpse of recent developments involving the nation's third largest long-haul carrier.

Anticipation is making them wait. US Sprint customers claim the Bell operating companies are providing AT&T with local access lines faster than they are for US Sprint, MCI Communications Corp. and others. This forces users either to wait for lines from the other common carriers or to buy from AT&T only.

One user, who requested anonymity, said he has experienced unusually long lead times for installation of long-distance services provided by other common carriers, and he laid much of the blame at the feet of the BOCs.

“We've had lines tied up for long periods because the OCCs couldn't get local access as fast as they wanted,” the user said. “We had one OCC that was trying hard to get quick local access for a line but was held up because of the BOCs. If AT&T was looking for that same local access, I'm sure they would have had it in a matter of days.”

Billing blunders. The carrier's billing problems remain a top concern for telecommunications managers. US Sprint has pledged to cure its back-office system ills, but, in the meantime, both parties are spending much time trying to verify bills. Some users have not received bills for several months.

The billing blunders have damaged user confidence in the carrier, making it more difficult to attract new customers.

The continuation of billing problems could even drive current users away.

Net gain. US Sprint claimed construction of an out-of-band signaling network, expected to facilitate the creation and provision of advanced communications services, will be completed by year's end.

The carrier is already using CCITT Common Channel Signaling 7 (CCS7) to set up calls between US Sprint sites on both the East and West Coasts.

The CCS7 subnetwork, which will connect centralized data bases containing customer-specific service information to network switches, will enable US Sprint to use its network switching and transmission resources more efficiently.

US Sprint would not divulge the cost of the signaling subnetwork and also refused to outline how it would use CCS7 to provide new voice services.

Error-rate measures. Users searching for a bit error-rate figure from US Sprint for its recently announced Clearline T1.5 service have been told the carrier measures bit errors on T-1 lines two different ways.

Dennis Dougherty, group marketing manager for US Sprint's digital private-line service, described the two methods:

- Background bit error rate (BBER) is the error rate on an operational, end-to-end circuit. The BBER on a T-1 line depends on the length of the circuit and how many segments the line includes.

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VOICE TECHNOLOGY

Mux makers prep sampling methods

Try to fit 96 voice channels on a T-1 line.

BY PAUL KORZENIOWSKI
Senior Editor

Many of the industry's leading T-1 multiplexer manufacturers are readying proprietary low bit-rate voice-sampling techniques designed to enable users to squeeze 96 voice channels onto a single T-1 link.

Companies reportedly working on sampling techniques that support digital voice transmission at 16K bit/sec include Newbridge Communications Networks Corp., Network Equipment Technologies Inc. (NET), Avanti Communications Corp. and Timeplex, Inc.

The new techniques apparently are modeled after and improve on adaptive differential pulse code modulation (ADPCM), a sampling technique that encodes analog voice signals for transmission as a 32K bit/sec digital bit stream.

Use of ADPCM enables a 1.54M bit/sec digital T-1 link to support 48 voice channels, which is an improvement on industry-standard PCM. PCM, still the most widely used sampling technique, requires 64K bit/sec worth of bandwidth for each voice channel. With PCM, a T-1 link can only support 24 voice channels.

A third sampling method, continuously variable slope delta (CVSD) modulation, is

See page 17

AT&T INTERNATIONAL CAPABILITY

SDN users get global feature

Worldwide SDN in works.

BY KARYL SCOTT
Washington, D.C. Correspondent

BASKING RIDGE, N.J. — AT&T recently announced a new international calling capability for Software-Defined Network (SDN) users that lays the groundwork for a global SDN service, expected to debut around 1990.

SDN customers can now make international, direct-dial calls to 146 countries from both on-network and off-network locations. The new capability gives SDN customers all of the network management, control and billing features associated with SDN when making direct-dial, international calls, AT&T said.

The SDN control and management features will enable a customer to grant or deny certain SDN locations or users the ability to place international calls through a call-screening feature. This feature had previously been available only on domestic SDN networks.

While this feature is still a far cry from having international SDN service, the network intelligence needed to provide this capability represents the precursor to global SDN service, said Michael Chaplo, SDN product manager.

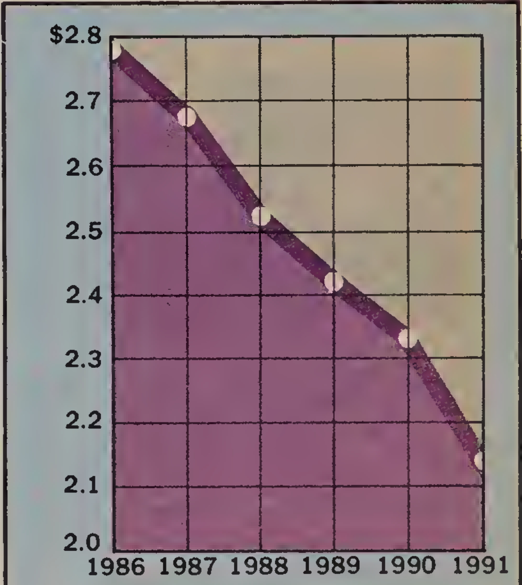
“This network intelligence marks a significant step toward making SDN an international service. Most of our SDN customers are large, multinational corporations that want a global SDN capability,” Chaplo said.

To place an international call, the SDN user will dial the 011 international access code and then the foreign telephone number. The call will travel over the customer's SDN to AT&T's international gateway.

The call will then be routed over international

See page 16

Interconnects' PBX and key system sales slide



▲Total sales in billions of dollars

SOURCE: NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.

TELECOM TIDBITS

Florida Power & Light Co. recently awarded a contract for five automatic call distributor (ACD) systems to **Rockwell International Corp.** The first and largest of the systems, a Galaxy GVS-3000, will be installed in Florida Power & Light's Southern Division, headquartered in Miami. The ACD is scheduled for cutover the first week of February and will be used for customer service and telemarketing.

According to a Rockwell International spokesman, plans are for four Galaxy model GVS-050 ACD systems to be installed in Florida Power & Light's call centers

See **Telecom Tidbits** page 16

Telecom Tidbits from page 15

in Daytona Beach, Ft. Lauderdale, Rockledge and West Palm Beach, Fla.

Harris Corp.'s Digital Telephone Systems Division announced recently that its 20-20 private branch exchange can be linked to **Digital Equipment Corp.** VAXes and other minicomputers and mainframes, using a T-1 Digital Multiplex Interface (DMI) developed by Advanced Computer Communications of Santa Barbara, Calif.

According to Harris, the 20-20/VAX interface reduces wiring and equipment costs and increases flexibility by replacing dedicated VAX terminal cabling with standard twisted-pair telephone wiring.

With the interface, the 20-20 PBX can service more than 500 VAX terminals through one T-1/DMI link to the host system. The 20-20 conforms to AT&T Communications and Information Systems Group's DMI specifications and can thus be linked via T-1/DMI to other conformant computers, such as the Hewlett-Packard Co. HP 3000.

National Gateway Telecom, Inc. has been awarded a five-year contract valued at up to $2.4 million from the **Defense Commercial Communications Office** for two T-1 1.54M bit/sec data channels linking Fort Belvoir, Va., and the U.S. Army base at Corozal, Panama. The primary and optional second circuits will be used by the Department of Defense to expand its wideband communications links to Panama.

National Gateway's earth station at Andrews Air Force Base in Maryland will be used for the service.

As part of an effort to streamline its operations, **The Lomas and Nettleton Co.** of Dallas recently installed an **Aspect Telecommunications** ACD. Lomas and Nettleton will use the 74-agent, 96-trunk Aspect CallCenter ACD to improve customer service by centralizing the company's call center operation. ◘

SDN users get global feature

continued from page 15

message telephone service (MTS) facilities.

"This new capability has required AT&T to increase its SDN network intelligence so that our switches can recognize an international MTS call coming from an SDN location and route it off of the SDN network onto AT&T's international gateway," Chaplo said.

The user will pay tariffed international MTS rates and a 30-cent-per-call surcharge for the new feature. A list of all international calls made by employees will appear on the SDN user's monthly bill.

The 30-cent surcharge covers the cost of providing the centralized billing and management features to the SDN customers, AT&T said. There is no installation fee for this service.

"The advantage of this feature is not cost," Chaplo said, "but the ability to manage international calling and to have a single, itemized bill for domestic SDN service and international MTS calls."

"The global networking approach certainly fits in with AT&T's long-term strategy," said industry analyst Frank Dzubeck, president of Communications Network Architects, a Washington, D.C.-based consulting firm. "It would be attractive to multinational corporations, such as international banks and export/import businesses, that have heavy international calling requirements. International SDN would give the telecommunications manager a single bill and a single method of managing the network."

International SDN means AT&T will have to install its own switches in foreign countries and negotiate with the Post, Telegraph and Telephone administrations for gateway rights, Dzubeck said. ◘

Bias still plagues US Sprint

continued from page 15

Dougherty said the carrier's BBER "service objectives" for the point of presence-to-point of presence segment of the line is 10^{-8}.

■ Burst error rate defined as the amount of errors associated with the switching of circuits in the US Sprint long-distance network. This momentary burst of errors occurs when Digital Access and Cross-Connect Systems (DACS) are switching a user's traffic from one T-1 circuit to another, Dougherty explained. The burst error rate is not included in the carriers's BBER calculations.

Foncard update. US Sprint also said 10 million Foncards for its fiber-optic travel service have been issued since the service was introduced six months ago. The Foncard provides users with automatic access to the US Sprint long-distance network. Users need only dial a single US Sprint 800 number from a push-button or rotary-dial telephone to reach the long-distance network. ◘

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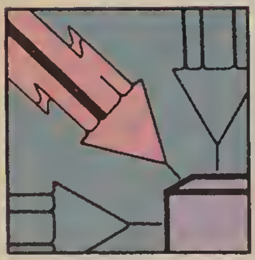

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Mux makers prep methods

continued from page 15

a vendor-specific sampling technique that enables customers to support 64 conversations on a T-1 line. CVSD has been available for a few years, but was unpopular because the voice quality typically was too low for commercial use.

The new sampling techniques should appeal to T-1 users who are interested in getting the greatest economies out of their high-bandwidth network facilities, according to James Davis, president of James Willis Davis, Ltd., a consulting firm in Chicago.

Companies that need a few more channels but cannot cost-justify two T-1 lines may consider alternative sampling methods, agreed George Kushin, senior vice-president of marketing at Avanti Communications Corp., a T-1 multiplexer maker in Newport, R.I.

Besides ADPCM and CVSD — and short of waiting for the new sampling techniques under development — customers today can opt for digital speech interpolation (DSI).

DSI increases the number of voice channels T-1 facilities can support by using gaps in ongoing conversations to support snippets of other conversations. David Marble, a consultant with Vertical Systems, Inc. in Dedham, Mass., said the benefit from DSI varies greatly. Used with certain sampling techniques, it can enable a T-1 to support 96 voice channels.

Although DSI works well in some applications, the technique has its limitations. Marble said music-on-hold, dial-up modem transmission and facsimile transmissions do not have silent periods. Further, DSI can occasionally limit the ability of one party in a conversation to regain control of a channel. Consequently, entire words may not be transmitted.

Customers who are interested in squeezing more capacity out of T-1 links typically are satisfied by adopting ADPCM instead of going with more technical solutions that require using DSI.

Lloyd E. Collins, director of network systems products at NET, said most customers opt for the company's ADPCM offering, which supplies 48 channels. He said few use NET's DSI product, which supports 64 channels when used in conjunction with NET's ADPCM.

During the first half of next year, NET plans to announce a sampling technique that will support 16K bit/sec voice channels. General DataComm, Inc. has already announced a product based on an ADPCM-like sampling technique and plans to deliver it in February. Newbridge has beta-tested its offering and is expected to unveil it during the first quarter.

Some companies, such as Timeplex, StrataCom, Inc. and Aydin Monitor Systems, Inc., can now offer 96 channels per T-1, using packetized voice schemes that combine DSI and packet-switching technologies. Timeplex's Link Packetized Voice Server supports up to 10 voice connections over a 56K bit/sec DS0 channel.

Two recent technical advancements are enabling vendors to develop the new products. First, microprocessors are now powerful enough to process the voice-sampling algorithms quickly.

Second, engineers have improved the algorithms themselves.

Analysts and vendors expect the first wave of products to have limitations. Tom Buchert, director of marketing at General DataComm, said that, in some cases, the quality of the transmission will be noticeably worse than current techniques. He predicted communications managers will test the products on the general work populace and give top managers proven techniques, such as 32K bit/sec ADPCM.

NET's Collins said he expects that standards bodies will work to improve transmission quality. Gary Hines, principal engineer at NET, said that during the last year, the Consultative Committee on International Telephony and Telegraphy has been working on standards for the 16K bit/sec sampling techniques.

The U.S. representative to that committee, the ANSI T1Y1 committee, recently solicited vendor input on these standards. The T1Y1 committee will meet in February and June to hammer out recommendations that could be included in the CCITT specifications.

Vendors will announce their implementations before these standards are complete. Avanti's Kushin said T-1 multiplexer vendors are in a race with carriers. The price of T-1 lines has been dramatically decreasing and should continue as regional fiber-optic companies complete their networks. Users may find it more economical to buy a second line, rather than to squeeze more channels out of a current line.

William Flanagan, assistant vice-president for network marketing at Newbridge, said T-1 lines are still expensive. He said he does not expect the cost to drop so users can justify adding another T-1 line. ◼

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>
> **L. David Passsmore**
> Principal
> Network Strategies, Inc.
> Fairfax, Va.

Users rate vendor services

1 = Poor 5 = Excellent

	Average of all vendors	Staff	AT&T	IBM	Digital Equipment Corp.	Codex Corp.	Paradyne Corp.	Unisys Corp.
Network design consulting	3.4	4.3	3.4	3.1	3.1	3.8	3.1	3.3
Adds, moves and deletions of components	3.4	4.1	3.1	3.1	3.7	4.1	3.2	3.5
Maintenance	3.4	3.9	3.5	3.5	4.0	3.8	2.9	3.4
Service at remote locations	3.4	3.8	3.3	3.5	3.4	3.7	3.3	3.6
Network software support	3.3	3.9	2.7	3.3	3.4	2.9	3.8	3.4
Backup technical support	3.3	3.7	3.3	3.1	3.3	3.4	3.3	3.5
Implementation assistance for new technologies such as T-1	3.3	4.3	3.0	2.3	3.3	2.7	3.7	3.0
Connecting existing networks	3.3	3.9	3.4	2.8	3.5	4.2	4.5	3.5
Network certification	3.3	4.1	3.1	3.3	3.7	3.7	3.5	3.3

Based on responses from 369 users.

SOURCE: THE LEDGEWAY GROUP, INC., LEXINGTON, MASS

CHART BY: SUSAN J. CHAMPENY

DATA COMPRESSION

Telcor modem debuts

Model supports file transfers at 38.4K.

BY PAUL KORZENIOWSKI
Senior Editor

NATICK, Mass. — Telcor Systems Corp. recently announced a dial-up modem that the company says can support file transfer at 38.4K bit/sec using a proprietary data compression algorithm.

The Accelerator 2938 is an asynchronous modem that supports two types of applications. For file transfers, the modem operates in half-duplex mode at a speed of 38.4K bit/sec. In interactive mode, the modem works at a speed of 9.6K bit/sec and conforms to the CCITT V.29 standards for half-duplex transmission.

The modem uses the quadernary phase-shift keying modulation technique and has fallback speeds of 2,400, 1,200 and 300 bit/sec. To ensure reliable transmission, the product supports Microcom, Inc.'s Microcom Network Protocol (MNP) from Level 1 through Level 6.

In addition to announcing the Accelerator 2938, Telcor enhanced its Accelerator 2496. The Accelerator 2496 now operates at 2,400 bit/sec in interactive mode and uses the company's compression technique to transfer files at a speed of 9.6K bit/sec.

The asynchronous modem uses quadrature-amplitude modulation. The Accelerator 2496 was enhanced to work with up to Level 5 of Microcom's MNP.

Both modems provide password and callback security features. In addition, the modems support encryption using the Data Encryption Standard.

Telcor, founded in 1983, offers a network management system that runs on IBM Personal Computers and enables a central operator to monitor up to 1,200 lines. The network management product provides an audit trail of all network events.

The Accelerator 2496 is priced at $895. The Accelerator 2938 will ship in the third quarter and will cost between $1,000 and $1,400.

CORPORATE INTEGRATION

Contel ASC tells VSAT strategy

Unit to offer Ku- and C-band terminals.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Contel ASC last week announced the formation of its Data Networks Division to market both Ku-band and C-band very small aperture terminal networks. Company officials said the union of these two technologies should put Contel in a unique competitive position in the evolving VSAT market.

The Data Networks Division combines two businesses that Contel ASC acquired in the last quarter of 1987 for a total of close to $100 million: Equatorial Communications Co., specializing in low- and medium-speed C-band networks, and Comsat Technology Products, which focuses on high-speed Ku-band technology.

“Our ability to sell both Ku-band and C-band networks allows us to address the entire VSAT market,” said Contel ASC President George Roberts. “This gives us a competitive and cost-effective edge that none of our competitors have.”

Contel ASC is a division of Atlanta-based Contel Corp., a $3 billion company that provides telecommunications products and services to corporations and the federal government.

Rockville, Md.-based Contel ASC is expected to be a $375 million business in 1988. It markets voice, video and data communications services to government, international and commercial sectors.

The union of VSAT technologies will give customers the choice of service that best suits their communications needs, said James Sobczak, senior vice-president of sales and marketing for the Data Networks Division.

For example, a user could choose a hybrid network that uses Ku-band VSATs at locations with high-speed data transmission requirements and C-band terminals where low-speed applications are needed, Sobczak said. “There's a substantial cost advantage in configuring a network this way because you only pay for the capacity that you need.”

Contel's statement of direction, made at a press conference here last week, was the first time since the acquisitions were announced that company officials outlined their plans for the VSAT business.

“The VSAT market is going to be a billion dollar market in the next decade, and Contel intends to be the market leader,” said Edwin Parker, president of the Data Networks Division and the founder of Equatorial.

“We currently have about 70% to 85% of the two-way VSAT market. We intend to grow the VSAT business and maintain our market

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ANALYSIS

NetView changes to suit the times

BY KATHLEEN DONIGAN
Special to Network World

A few years ago, data networks consisted of a single host and a number of terminals. Currently, networks encompass multiple hosts in a variety of buildings connected by miles of telephone lines. Previously, network managers had to monitor only connections between computers. Now, they oversee computers as well as connections.

Consequently, customers are searching for new types of network management tools. The ultimate solution will provide a manager with the ability to manage all components on a communications path. However, such tools are not yet available.

Recognizing the changing market, IBM has been busily designing a set of products to fill the void. In May 1986, the company introduced a host-based network management system, NetView. Six months later, IBM unveiled a gateway from other network management systems to NetView, NetView/PC. During 1987, IBM enhanced both products.

NetView is IBM's cornerstone network management product. Previously, IBM network management consisted of many separate products that were limited to special tasks and operated only in certain environments. NetView consolidated these functions in one package, consisting of a control facility, a hardware monitor, a session monitor, a status monitor, a help facility and customization facilities. The product improved the ability of

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Donigan is a product manager at Communications Solutions, Inc., a San Jose, Calif. communications software and consulting firm.

NetView suits the times

continued from page 19

IBM products to manage a network centrally, as well as to diagnose and control problems.

The control facility is based on IBM's Network Communications Control Facility. It contains a command language that allows a network operator to write a program that controls resources such as modems and protocol converters. Initially, NetView provided only limited capabilities for managing a distributed network. For example, a copy of NetView running on one host could not exchange information with a version running on a second host.

The hardware monitor, similar to IBM's Network Problem Determination Application, gathers operational information about components such as the host, disk drives, tapes and controllers. The hardware monitor displays the device status and recommends actions that an operator can take in case of a problem.

The session monitor, an outgrowth of the Network Logical Data Manager, determines which terminal is conversing with which host application. It helps operators determine what is preventing a terminal from accessing an application. A session monitor also collects response-time and session-failure information.

The status monitor, with roots in IBM's VTAM Control Node Application, monitors network equipment and displays current and historical performance information. The status monitor is used to restart a failed connection.

NetView also improves on the on-line help that IBM provided network operators. Operators can request specific help for an item on a screen or general help about any part of the NetView product. Another feature, Helpdesk, leads an operator through typical problem scenarios and prompts the operator to perform specific tasks at the proper time.

NetView's customization facilities allow a user to tailor the product to meet specific needs or perform unique tests. By combining all of these functions under NetView, IBM simplified network management installation and reduced the training time for network operators.

NetView/PC, announced in September 1986, enabled NetView to manage non-Systems Network Architecture equipment, such as private branch exchanges, the IBM Token-Ring Network and other vendors' products. NetView/PC, which runs on an IBM microcomputer, gathers non-SNA network management data and reformats it for display on a NetView console. Alerts are forwarded to NetView by Network Management Vector Transports (NMVT). NMVT can combine information generated by several devices and send it over one SNA link.

NetView/PC provides an application programming interface/communications service (API/CS), so requests for net management information from user-written programs can be passed to NetView/PC. Vendors of T-1 multiplexers, local nets or modems can use the API to send messages from their network management systems to NetView through NetView/PC.

Since the initial introductions, IBM has enhanced both NetView and NetView/PC. The enhancements address user concerns about the products' ease of use, limited functionality and support for IBM products.

NetView Release 2, which was announced in June 1987, extended support of NetView from mainframes running MVS operating system to the IBM 9370 departmental processor under VM.

IBM also automated additional network operations by bringing another product, Network Management Productivity Facility,

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Data Communications

McGraw-Hill's Magazine of Information Networks and Communications Technology

Recasting today's digital branch exchanges page 100

Darlane Hoffman, Metropolitan Life, New York, N.Y.

Squeezing line costs via data compression

A technology that promised to cut the number of leased lines by 50 percent sounded too good to be true. Here's how one insurance company evaluated it.

The data communications team at Metropolitan Life Insurance had heard that, in theory, data compression could work miracles with throughput rates and line costs. But the company already had a well-running network—and making it more economi-

Learn more about how Symplex data compression can help *you* achieve your network throughput and performance objectives. Simply return this card for a free reprint of ***"Squeezing line costs via data compression."*** Written by Darlane Hoffman, Data Communications Manager at Metropolitan Life Insurance Company, this interesting article explains how they tested, compared, installed, and use Symplex products to save over *2 million dollars* a year in leased line charges.

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ough a CLIST.

f a CLIST routine fails,
View Release 2's Genalert generates a message notifying an operator of the problem and listing all the steps taken to fix the problem.

A distributed version of NetView enables copies of the programs running at remote sites to gather performance information and send it to a central facility. This allows a network to be operated by one, centralized operator staff.

A second release of NetView/PC introduced generic alerts, which make it easier for non-IBM equipment to send information to NetView. Previously, vendors had to write software and describe each alert. IBM chose a number of common messages and developed interfaces describing each one so vendors no longer have to write that code.

IBM also unveiled NetView Distribution Manager, which enables an operator to distribute applications, files and updates to remote locations. IBM's Network Performance Monitor (NPM) was also brought under NetView. NPM informs users of performance characteristics on a networkwide basis. Customers use this information for capacity planning and to design large networks.

Despite the enhancements, the IBM products still have several shortcomings. For example, NetView does not do a good job of managing non-IBM local networks. Also, the product has to be integrated with IBM's Configuration Management system, which helps users design large networks. NetView support has to be included in non-network products, such as host operating systems and subsystems. IBM must also develop more efficient LU 6.2 links to NetView.

The initial announcements and enhancements illustrate the importance that IBM places on network management. If IBM fixes the outstanding problems, NetView has a good chance of becoming a de facto standard. ◘

Contel ASC tells strategy

continued from page 19

position by being a very market-driven organization," Parker said.

In the past, users were hesitant to invest in unproven VSAT technology and worried about the future of start-up firms such as Equatorial. "With Contel's resources behind the VSAT venture, I think users' reservations will disappear," Roberts said.

Michael Prince, data processing manager for Burlington Coat Factory Warehouse Corp. in Burlington, N.J., took a chance with Equatorial in 1986 by installing a 105-VSAT network, but he said the Contel acquisition has reinforced his commitment to VSATs.

"We feel very positive about the acquisition. We had reservations about Equatorial's small size and staying power, but we believe Contel is very stable and will expand the market for superior VSAT technology," Prince said.

Other Contel VSAT customers include *USA Today*; Xerox Corp.; Sears, Roebuck and Co.; the American and New York Stock Exchanges; Avis, Inc.; Dow Jones & Co., Inc. and the National Weather Service.

Industry analysts agree that Contel ASC has a great deal of VSAT market potential. "From a strategic viewpoint, the acquisition was a good fit with Contel's networking and telephone businesses," said James McCabe, vice-president of telecommunications research at Nomura Securities International, Inc. in New York. ◘

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Annual leased line savings total $2.2 million.

By installing Symplex Datamizer data compressors throughout the Met Life network, Darlane and her team were able to *eliminate more than 200 leased line circuits.* This cut their line charges by 55%, saving over *2 million dollars* in only the first 12 months after implementation.

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Datamizers gave Met Life instant network expansion.

While the Datamizers were able to eliminate scores of parallel leased lines in Met Life's network, they also allowed rapid installation of additional applications *without installing new circuits.* In fact, utilizing 14.4 kbps modems, Met Life's Datamizers enabled circuits previously running 32 interactive terminals to operate up to 96 terminals, *with no degradation in response time.*

This gave Met Life the opportunity to *triple* the amount of service to their customers, while avoiding the cost of additional leased lines, and the wait for their installation.

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LOCAL NETWORKING

“We are seeing a major trend away from mainframe-based applications and toward personal computers tied together in flexible and responsive networks. It is estimated that there are three million business personal computers linked together in such networks today, and this number will grow to 35 million within the next five years.

Herbert McCauley
Vice-president
Information management
Harris Corp.
Speaking at a Harris-sponsored
seminar on local networking.

NETWORK APPLICATIONS SUPPORT

DEC lays down integration plan

Apple deal key part of linkage strategy.

BY JOSH GONZE
Senior Writer

BOSTON — Digital Equipment Corp. said at a strategy meeting here last week that its recently announced agreement with Apple Computer, Inc. is one stroke in a broader strategy to bring non-DEC computers into DECnet.

At the MacWorld Expo in San Francisco two weeks ago, DEC and Apple unveiled a joint development agreement through which they will develop products that integrate Apple microcomputers and local networks with DEC VAXes and DECnet.

Last week, with John Sculley, Apple’s chief executive officer, and other top Apple executives present, DEC President Kenneth Olsen said the Apple agreement is just one piece of a larger integration strategy — dubbed Network Applications Support (NAS) — to achieve applications compatibility across all systems deemed “important to our customers.”

“With Apple, we announced a joint effort to integrate the Macintosh and AppleTalk into DECnet,” said Henry Ancona, DEC vice-president of business and office information systems. “We are very excited about the potential of that effort. But it is only a piece of DEC’s broader strategy.”

DEC did not introduce any new products at the strategy briefing.

The company said NAS facilities provide common access to services on DECnet. The devices supported within NAS include DEC’s VT family of terminals, VMS-based VAXes, Unix-based systems running on VAXes, Apple Macintoshes and MS-DOS- and OS/2-based personal computers.

DEC’s gateways to Cray Research, Inc. supercomputers and to Systems Network Architecture networks are also part of the NAS strategy.

NAS is intended to allow users of these devices to exchange electronic mail and revisable form documents, share files and access common printers and data bases within an enterprise network based on DECnet.

“DEC’s strategy is to define a comprehensive set of network application services that simplify building network applications,” said William Strecker, DEC’s vice-president for product strategy and architecture. “Further, DEC not only provides these services for its VAX/VMS systems, but also for other key, industry-defined systems.”

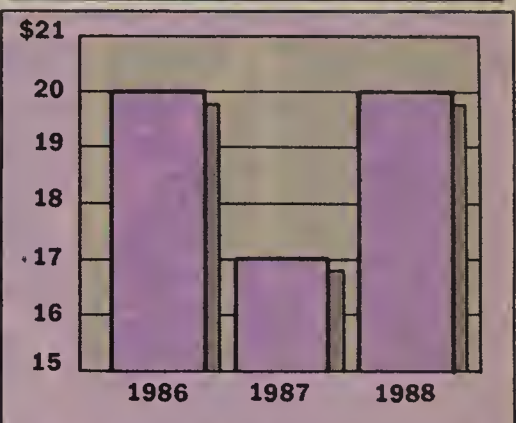
During the briefing, Strecker made an oblique reference to IBM’s integration strategy, its Systems Application Architecture (SAA). SAA is IBM’s blueprint for linking applications running on diverse processors.

“Organizations need a common applications environment from the desktop to the data center,” he said. “Other vendors have announced elaborate future programs to somehow layer this kind of environment on a hodgepodge of incompatible computer architectures. DEC has a much simpler approach.”

Strecker described NAS as the third prong of DEC’s overall mar-

See page 29

MAP product sales



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LAN SOFTWARE

NovaNet taps into idle workstations

BY JOSH GONZE
Senior Writer

AUSTIN, Texas — CYB Systems, Inc. recently unveiled software designed to enable users on a Novell, Inc. NetWare-based local network to forward batch tasks to a network server for concurrent processing on any available workstation.

Dubbed NovaNet, the software lets users run interactive tasks on their networked personal computers, while batch tasks, such as recalculating a spreadsheet, are sent to the server to be distributed for processing by other workstations on the network.

The software resides only on personal computers, not on the server, and is designed to take advantage of idle workstations. Before the stations can be treated as available processors, the last user must indicate that the workstation is available by keying in the appropriate command.

NovaNet is derived from a CYB software product called NetFrame, which performs exactly the same functions as NovaNet but works with CYB’s proprietary local network software, Unite. Unite is a server-resident program that runs on CYB’s own Unix-based processor.

The NovaNet program features a user interface called a submit editor, which is a menu-driven way of capturing information from individual workstations on a network and submitting them to the network. The NovaNet program works in two steps, according to Daniel Kiegler, director of marketing at CYB. First, jobs are queued on the Novell file server in a directory of batch tasks awaiting processing. A user can use a workstation for interactive tasks while the batch job awaits an available processor.

Second, other network workstations query the server in search of jobs. Once a workstation identifies a batch task in the directory, it pulls the necessary data, executes the job and places the results wherever directed by the task instructions. Users can set parameters that specify the type of workstation necessary and where output should be sent.

NovaNet is offered in packages configured to match the number of submitting processors and task processors the customer wants to utilize. Acknowledging the unfamiliar nature of the service NovaNet provides, CYB is offering two starter kits.

For $149, a user can get a package of three copies, supporting up to three submitting or task processors, which can perform up to 100 separate submits. A package allowing up to eight processors and 500 separate submits is available for $595. The network server must run NetWare Version 1.0 or higher.

CYB also said it plans to combine a NovaNet-type program with an Intel Corp. 80386-based microprocessor for faster batch task processing and to serve as a gateway to other local nets. The product, CYBdpNet, is scheduled for third-quarter availability.

LINKING LANS

Corvus offers new gateways

BY PAUL KORZENIOWSKI
Senior Editor

SAN JOSE, Calif. — Corvus, Systems, Inc. recently announced three new gateways, developed to improve the communications options between its Omninet line of local network products and large computer systems.

The gateways enable local network users to communicate with IBM mainframes using Systems Network Architecture or X.25 links and with other computer systems using X.25 connections. The products operate on Corvus’ Omninet, which supports the company’s implementation of Network Basic I/O System.

“It’s important for our customers to know they have the ability to connect to other computer environments,” said William R. Halford, vice-president of marketing at Corvus.

Each gateway includes communications software, a communications card that fits in an IBM Personal Computer and a shielded adapter cable. The gateways come in two versions. One model supports eight users and 32 sessions, and the second works with 254 users and 254 sessions.

Omnispan SNA/3270 emulates an IBM 3274 controller and enables a user to access an application running on an IBM mainframe with IBM’s MVS or VM operating systems. A microcomputer is transformed into an IBM 3278 or 3279

See page 29

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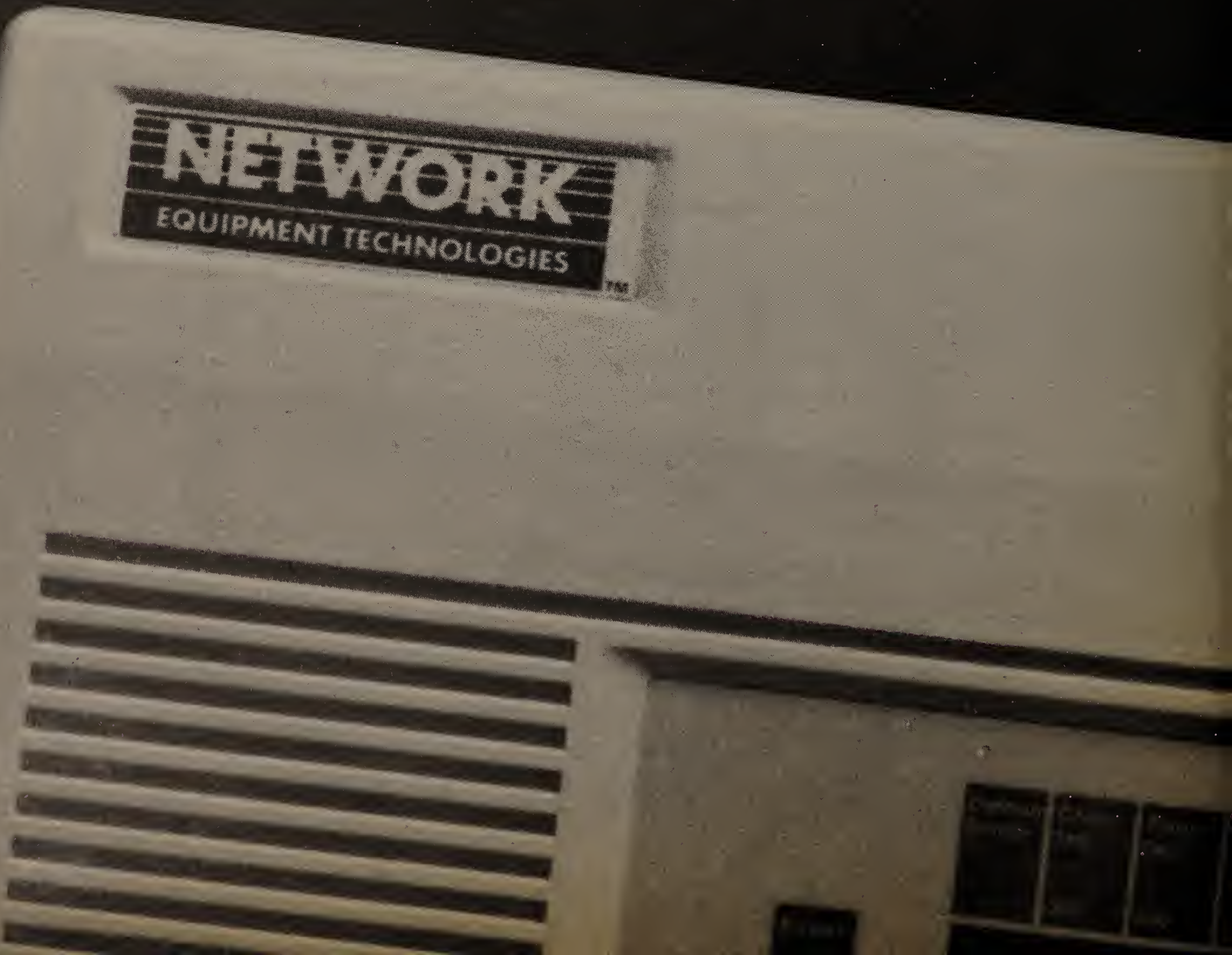

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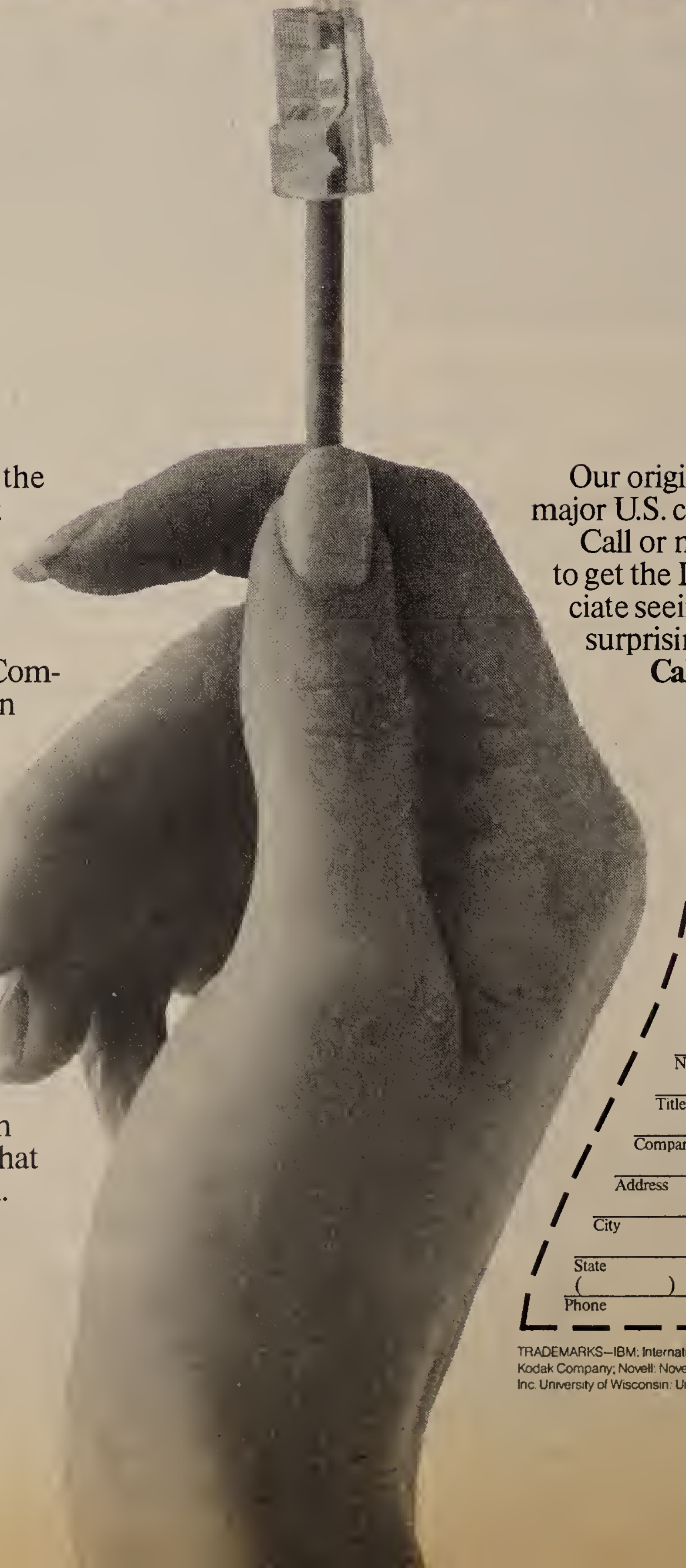

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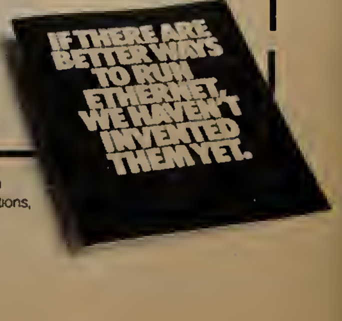
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NETWORK NOTES

Oracle Corp. of Belmont, Calif., and **Convergent Technologies, Inc.** of San Jose, Calif., last week announced a joint agreement to develop relational data base products for the Convergent Technologies Operating System.

The companies will develop versions of Oracle products including DBMS, SQL*Forms, SQL*Plus, as well as Pro*C, Pro*Pascal and Pro*Cobol precompilers. Convergent systems supported will include the company's New Generation workstations and Shared Resource Processor network services.

The products will go head-to-head with those offered by Digital Equipment Corp. and IBM.

Oracle will sell the products, but Convergent will have marketing rights, which means it can resell to a limited number of customers.

The new products will be available in mid-1988.

Digital Equipment Corp. of Maynard, Mass., recently paid $150,000 to became the first corporate member of the Massachusetts Institute of Technology X Consortium, a group formed to further the development of the X Window System.

DEC also said it will supply the consortium with resources and software engineers and will help develop system functionality in the areas of documentation, software validation, tool kits, three-dimensional and video graphics, as well as image processing.

The X Window System is a windowing system for bit-mapped graphic displays. It has become a de facto standard and the foundation for DEC's future workstation interface, the company said. The system is aimed at eliminating the end user's concern for hardware compatibility in a network.

Over the past five years, DEC invested more than $30 million and supplied a staff of software engineers in MIT's Project Athena, which led the X Window System's development.

The first consortium meeting was held Jan. 13 to 15 at MIT.

Microsoft Corp. of Redmond, Wash., recently started shipping its solution to spreadsheet networking problems — Microsoft Excel User Packs and full Microsoft Excel support for microcomputer networks.

Microsoft Excel, an MS-DOS spreadsheet, is installed on the server, and each additional user needs only to attach a User Pack containing manuals and keyboard templates. The number of users can be fewer than the number of nodes on the network.

The Microsoft Excel stand-alone package costs $495, and each additional User Pack costs $250.

DEC lays down integration plan

continued from page 23

ket thrust. The VAX/VMS architecture forms the first prong, and DECnet, which DEC officials now call DECnet/OSI, forms the second, he said.

NAS products are designed to provide multivendor communications services in three basic areas: application access services, business communications services and information/resource-sharing services.

Application access services enable users to take advantage of application programs residing anywhere on the network. For terminals, DEC's All-In-1 is the NAS protocol, while for workstations, DECwindows, based on the X Windows standard, is specified.

Business communications services encompass the exchange of end-user data between computers. This category includes electronic mail, corporate videotex, electronic conferencing and electronic data interchange. DEC's offerings in this area are based on the X.400 and X.12 protocols, Strecker said.

Information- and resource-sharing services include file sharing, printing and publishing, document interchange and data base access. Document interchange will be supported through the Digital Document Interchange Format.

The approach DEC chooses to extend NAS services to other vendors' equipment depends on "the nature of the external system," Strecker said. That approach can range from a simple DEC-provided gateway to a full-blown DECnet implementation, he said.

DEC officials said MS-DOS- and OS/2-based personal computers were brought into the NAS plan with product announcements over the past year and a half. The products included the company's DECnet-DOS and VAX/VMS Services for MS-DOS software.

Corvus offers new gateways

continued from page 23

terminal or IBM 3287 printer. The gateway includes file-transfer software so users can exchange information with a mainframe.

The gateway also includes IBM graphics capabilities, including support for various programmed symbols, extended highlighting and color support for IBM's Graphics Data Display Manager and other graphics packages.

The gateway runs on an IBM Personal Computer XT or Personal Computer AT and requires 150K bytes of random-access memory. An eight-user version of Omnispan SNA/3270 costs $2,369, and the 254-user version costs $3,510.

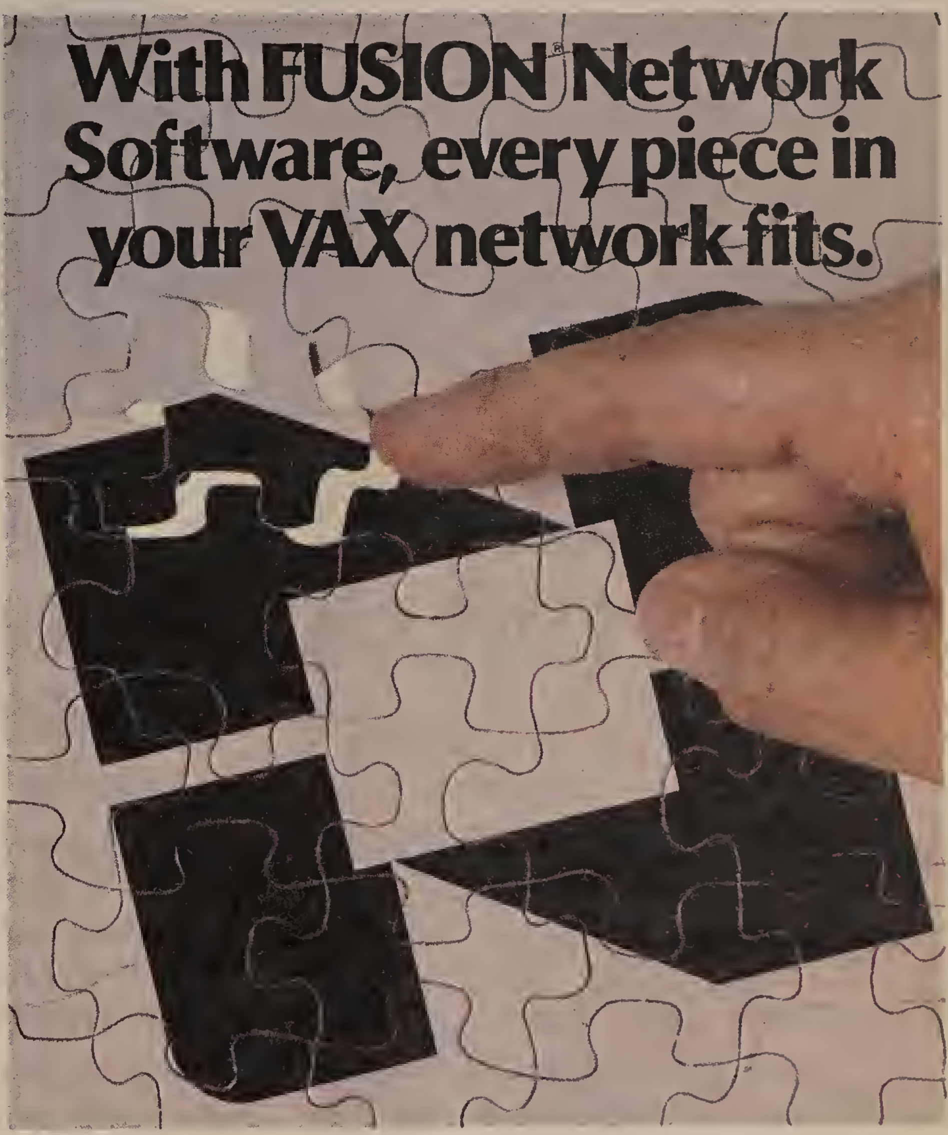
Omnispan X.25 enables network users to communicate with remote asynchronous hosts using X.25 network services. The software conforms to CCITT X.25, X.3, X.28 and X.29 protocols. Customers can send information over a number of domestic X.25 networks, including Telenet, Tymnet and international networks such as Datapac. A network administrator can customize each connection through a definable network configuration, which would outline the type and number of virtual circuits and terminal addressing.

Omnispan X.25 includes terminal-emulation software that enables a microcomputer to mimic a teletypewriter or Digital Equipment Corp. VT-100 terminal. Omnispan requires 130K bytes of RAM. The product supports VT100 terminal emulation. An eight-user version sells for $2,115, and the 254-user model is priced at $3,279.

Omnispan Qualified Logical Link Control enables customers to communicate with an IBM mainframe running the MVS or VM operating systems over an X.25 network. The gateway emulates an IBM 3274 controller, thereby allowing microcomputers to emulate IBM 3278 and IBM 3279 terminals as well as IBM 3287 printers.

The software conforms to CCITT X.25, X.3, X.28 and X.29 protocols so users can access domestic and international packet-switching networks. The X.25 link supports Tymnet's Binary Synchronous Display Systems Protocol and DSI 3270 protocols.

Omnispan QLLC uses 180K bytes of RAM. An eight-user version of QLLC sells for $2795, and a 254-user version costs $3,999.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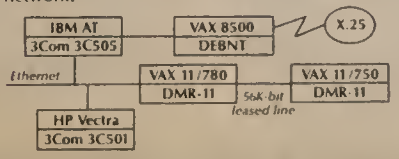

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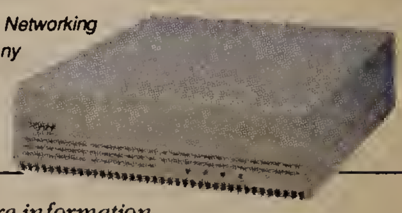

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COMMUNICATIONS MANAGER

Spending plans thrive

Despite economic uncertainties, more than 40% of U.S. corporations expect to increase capital spending in 1988, compared to 33% last year, according to The Dun & Bradstreet Corp.'s latest Dun's 5,000 survey. The survey found that only 8% of the businesses surveyed in late November said continuing volatility in the stock market had adversely affected their capital-spending plans. The company surveyed 5,000 U.S. companies.

UNITED AIR LINES

Airline network strategy intended to woo clients

BY JIM BROWN
New Products Editor

CHICAGO — In an ongoing attempt to differentiate its Apollo airline reservation network from competing services, Covia Corp. is revamping its network to enable travel agents to do more than book travel-related reservations.

At the same time, Covia is faced with making network changes to support the internal data processing and communications needs of parent company United Air Lines, Inc., while attempting to slash its $110 million per year network budget.

Covia is counting on its distributed Open Systems Architecture as a way to meet that challenge. The three-level network architecture will eventually consist of equipment at travel agencies, a series of 10 regional processing centers and a central processing facility.

The architecture is based on IBM's Systems Network Architecture and includes IBM's LU 6.2 Advanced Program-to-Program Communications as well as IBM Token-Ring Networks.

At the travel agent level, Covia is pitching Focalpoint, a package that includes IBM Personal System/2 Model 50s linked via an IBM Token-Ring Network. Travel agent systems can be as small as two Personal System/2s and a printer.

The company also plans to create 10 regional processing sites and is close to bringing up a customized set of LU 6.2 services on the network. Regional processing sites will off-load processing tasks from the current central site and will reduce network costs by cutting the distance that transactions travel.

Travel agents are currently supported with multidrop lines from front-end processors at 10 regional sites. Those regional sites are linked via a recently completed T-1 backbone network to Apollo's central processing site in Denver.

That T-1 network gave Covia a 300% increase in overall network capacity. It also trimmed Covia's data transmission costs by between $1.4 million and $1.7 million by combining data traffic from Apollo and United's internal administrative networks.

Covia also plans to integrate existing private-line voice network services on that T-1 backbone as part of a plan to trim another 10% from its telephone bill.

Barry Kotar, Covia president, said Covia is likely to use excess network capacity to offer additional services to its travel agent customers, rather than simply selling raw bandwidth to the highest bidders on the open market. Those additional services would be offered in an attempt to differentiate Apollo from other airline reservation systems and attract new business.

"Computerized reservation system vendors are nothing more than intermediaries in terms of how they display information from airlines

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The largest U.S. employers in 1987

Company	1987	Change from 1986
General Motors Corp.	876,000	+65,000
Sears, Roebuck and Co.	485,400	+19,400
IBM	403,500	(2,000)
Ford Motor Co.	382,300	+13,000
General Electric Co.	359,000	+55,000
K Mart Corp.	330,000	+40,000
AT&T	316,900	(21,000)
Pepsico, Inc.	214,000	+64,000
Marriott Corp.	194,600	+40,000
United Technologies Corp.	193,500	+8,700

ITT Corp., previously the seventh largest employer in the country, reduced its work force by 109,000 in 1986, moving it down to 24th on *Ward's* list of the 1,000 largest domestic employers.

SOURCE: *WARD'S BUSINESS DIRECTORY*, BELMONT, CALIF.

USERS GROUP

Symplex users hold first meet

Attendees to share ideas about data compression.

BY BOB BROWN
Staff Writer

WASHINGTON, D.C. — Users of Symplex Communications Corp.'s data compression network equipment are scheduled to meet here today for the first-ever gathering of the Users of Symplex Equipment Roundtable (USER).

USER will be a forum for members to share their experiences with data compression equipment made by the Ann Arbor, Mich.-based Symplex, according to USER President Walter Kerner, a systems consultant in data communications at Metropolitan Life Insurance Co. in New York. "When you have 400 [Symplex] devices in your network like we do, you have to tap other people's ideas to maximize your network," Kerner said.

The group's other main purpose is to offer suggestions to Symplex on promoting continuing technical progress, he said.

Symplex said it will unveil its newest development — a dual-trunk Datamizer II SDC-8e data compression unit — at the meeting. The device compresses synchronous and asynchronous data from up to eight incoming lines at speeds up to 19.2K bit/sec over one or two 19.2K bit/sec trunks.

Today's meeting was scheduled for the day before the opening of the Communication Networks '88 trade show here in hopes that users would arrive early to take in the USER meeting, Kerner said. There is no charge for membership, but there is a meeting fee, he said.

Symplex got the USER ball rolling by insert-

See page 32

GUIDELINES

ERIC SCHMALL

Nothing stays the same except change

For all its supposed importance, planning in this profession still suffers from the misguided notion that generally accepted principles of forecasting will see the manager through from year to year.

Like many ill-fated military commanders, telecommunications planners often work up magnificent schemes that prepare their organizations to fight the last war. Right now, a large number of telecommunications departments are busily pouring the foundations of technological Maginot Lines.

Tomorrow, next week, next quarter, that brilliant edifice of winking lights will be outflanked — either by a competitor, another department's approach or some more pressing corporate priority.

How can this happen repeatedly, despite the hours and weeks of careful analysis and planning? No manager plans to fail, but many fail to plan well.

Many more layers exist in the process, beyond the deceptively honest, obvious ones. Certainly, managers must review and prioritize needs and build business cases to support them. And managers have to coordinate their plans with the known activities of those they support.

It's all so logical and straightforward that one expects few if any problems in a plan's development and execution. Yet, just below this thin membrane of purposeful order lies a simmering chaos of unknown — and in some cases unknowable — change that can bubble up and quickly dissolve the most rigid and durable of plans.

Adherence to predicted activity is becoming increasingly difficult in the communications department. Its function stretches out so far and so deeply into the organizational structure that significant changes even in remote parts of the corporation can play havoc with a communications plan.

A review of the annual telecommunications plan can give managers a quick realization of this truth. How many plans, carefully set out in January 1987, actually came to pass? How many were preempted by events that weren't visible on the planning horizon six, nine or 12 months ago?

It may come as a shock to find that 20% or 30% of the originally scheduled plans never matured.

These projects might be victims of a dramatic business change, the sudden

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Schmall is network systems manager for an insurance holding company.

Airline strategy to woo clients

continued from page 31

and other travel-related companies. The advantage one has over another is in the products and services they offer to the travel agencies,'' Kotar said.

Agencies may use the network capacity to be offered by Covia to network multiple offices or to establish links to major corporate clients. That capacity could also be used to offer automatic call distribution and telemarketing services to travel agents.

Kotar also said other networks Covia oversees could be used to provide additional services to clients.

For instance, members of United's Mileage Plus frequent flyer club could be offered the ability to dial in to United's private virtual network from Westin Hotel Co. locations. "Rather than use AT&T, Mileage Plus members could dial into our network,'' he said. That service could save travelers long-distance phone expenses.

The Open Systems Architecture plan is moving forward even as Covia is stripped from its parent, Allegis Corp., which is also the parent of United.

In order to stave off takeover attempts last year, Allegis sold off Westin Hotels and The Hertz Corp. car rental companies and agreed to put 50% of Covia up for sale. United will retain the other 50% and have managing control of Covia. Kotar said he expects to find a buyer within the next month.

In the reorganization, 1,900 MIS personnel were shifted from United to Covia. Covia also picked up responsibility for providing internal DP and communications services for the airline. Covia will also continue operating the Westin Hotel reservation system.

Covia has some 8,500 travel agencies using more than 40,000 terminals on the Apollo network. The company had $350 million in revenue last year, 75% of which came from transaction processing fees charged to travel agents. Covia makes between $1.85 and $2.10 each time a travel agent uses Apollo to book a flight.

Covia hopes to convert many of the travel agencies still using Apollo dumb terminals to Focalpoint. Between 80 and 90 agencies have already installed between 1,000 and 1,200 Focalpoint workstations, Kotar said.

At the heart of Focalpoint is a Personal System/2-based file server and communications gateway running Covia's Open System Manager (OSM) software.

OSM manages traffic on the local network and establishes and manages sessions with the Apollo host. Requests for host data generated on the Personal System/2 are converted to an IBM 3270 Synchronous Data Link Control data stream by OSM. OSM also converts Personal System/2 application commands to LU 6.2 commands, which are passed to an LU 6.2 application running on the host. That LU 6.2 application is designed to download host data transparently to local applications.

Focalpoint also enables the travel agents to get away from the somewhat cumbersome and cryptic Apollo commands by creating scripted applications.

The next step in Covia's plan is to expand Apollo's LU 6.2 services. "Clearly, the thing that is most important to us is to put our LU 6.2 support network in place,'' said Mark Teflian, vice-president of technical planning and systems engineering.

Apollo already supports LU 6.2 services for travel agencies serving corporate clients. Teflian said additional session management, concentration and recovery must be developed before the entire network operates under LU 6.2. Covia is working with three third-party vendors to develop a more custom-tailored set of LU 6.2 services, expected to be released in the third quarter.

To trim transmission costs, Covia installed a network of Amdahl Communications Systems Division T-1 multiplexers. Those T-1s support communications between the 10 regional centers as well as United's internal administrative computer systems at Chicago's O'Hare Airport, San Francisco's International Airport and Denver's Stapleton Airport.

The T-1 network supports subrate channel speeds of 9.6K bit/sec and 56K bit/sec. A series of about 90 multidrop lines ranging in speed from 2,400 bit/sec to 9.6K bit/sec are fed into the T-1 network via Raytheon Co. remote communications concentrators at the 10 regional centers. Previously, Covia had a mix of T-1 and 56K bit/sec dedicated circuits between the regional centers and the Denver operations center.

The T-1 lines terminate at Computer Communications, Inc. CC 85 front-end processors that are channel-attached to modified IBM 3090 mainframes in Denver. Teflian said Covia plans to replace the remote Raytheon controllers with IBM 3725 front-end processors.

Although it was just completed, Teflian said Covia will likely upgrade the T-1 network within the next two years in favor of more intelligent T-1 multiplexers capable of supporting integrated digital network-like services and tandem switching, which could then be offered to travel agents. "I think the strategic business value for Covia is to have a private ISDN-type capability across the network,'' Teflian said.

Nothing stays the same

continued from page 31

fascination with or rejection of some telecommunications technology by senior managers, or some sharp corporate turn toward a new product or service that upends priorities and projects.

Under such circumstances, the orderly, established plans that drove the department's activity are quietly washed over the edge of history.

Communications planners acknowledge the imprecision of their craft. They have to have flexibility in their long-range plans, allowing for some reasonable amount of unscheduled staff time, labeled "Unknown Projects,'' to absorb the shock of the anticipated yet undefined work that will undoubtedly surface.

They will have to know which of their already planned activities have lower level importance, so they can quickly jettison them when a critical, unanticipated task suddenly springs forth.

Telecommunications planners pay little heed to Shakespeare: The past is prologue only in the case of increasing change. The generally accepted principles of change offer an incomplete and imperfect guide to the needs of the communications department.

Much activity in the telecommunications industry drives sudden and opportunistic events that come up and call for immediate action.

Within their own organizations, telecommunications managers find similar sudden shifts in activity. Developing a skill to sense when and where these changes are likely to occur allows managers to achieve a more comprehensive degree of realistic, flexible planning capabilities for the challenges of future, not past, battles.

Symplex users hold first meet

continued from page 31

ing a card in its newsletter last spring to sample user interest, said Kathleen Xydis, a Symplex spokeswoman. There are about 50 members in the group.

Hewlett-Packard Co. of Palo Alto, Calif., Booth Newspapers, Inc. of Grand Rapids, Mich., and Harris Corp. of Melbourne, Fla., are among the USER members.

These companies' common interest, data compression, is the use of algorithms to squeeze data prior to transmission. As a result, data lines can carry up to four times their rated volumes of information per second at a savings to the user, Xydis said.

Metropolitan Life's Kerner credited the technology for saving his company $2 million a year and freeing up network capacity to handle emergencies and growth. Symplex has delivered more than 7,000 data compression systems.

Kerner said the USERS group plans to hold a second meeting in San Diego this September.

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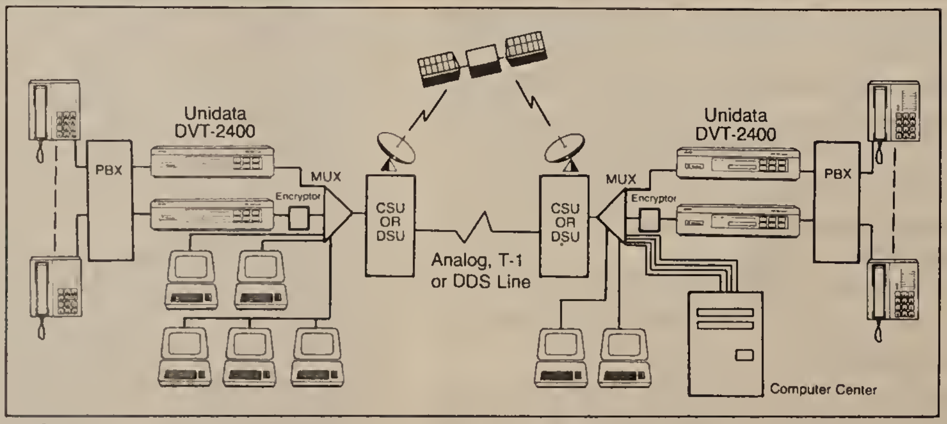

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- ▶Delta Computer pocket modem

▶ *LAN-TO-LAN*

Micom internet wares bow

Board, software allow NetWare PCs to access TCP/IP hosts.

BY JIM BROWN
New Products Editor

BOXBOROUGH, Mass.— Micom-Interlan, Inc. recently announced an add-on board and software that enable IBM Personal Computers to access TCP/IP-based hosts while remaining logged on to a Novell, Inc. NetWare network.

The new product, TCP/IP Workstation, supports both Transmission Control Protocol/Internet Protocol and Versions 2.0a and 2.1 of the NetWare local network operating system.

With TCP/IP Workstation, a Personal Computer can access NetWare file servers and TCP/IP-based hosts supported on the same Ethernet backbone without using a gateway. The product also enables the Personal Computer to access applications that support IBM's Network Basic I/O System.

TCP/IP Workstation is based on Micom-Interlan's existing PC/TCP software, which enables Personal Computers to link to TCP/IP-based networks.

Micom-Interlan also offers a TCP Gateway that provides a link from a NetWare-based network to a backbone Ethernet supporting TCP/IP.

The software component of the new product enables the Personal Computer to support such TCP/IP applications as file transfer protocol (FTP), FTP server, Telnet virtual terminal protocol and simple mail transfer protocol (SMTP).

FTP enables the Personal Computer logged on to NetWare to exit from a NetWare-based application and issue a DOS-based command to access a host supporting TCP/IP, such as a Digital Equipment Corp. VAX minicomputer. The user can then download a VAX file to the NetWare file server while remaining logged on to NetWare. With previous products, users were required to log off of NetWare to download files.

FTP server enables other TCP/IP devices to access the Personal Computer and download files. For example, a user leaving work for the day can leave the Personal Computer in FTP server mode, thus enabling a VAX system operator to access the Personal Computer and backup hard disk files remotely on the VAX system.

The Telnet virtual terminal protocol enables the Personal Computer in emulation mode to log on remotely to either a VAX or an IBM host over the Ethernet network. SMTP enables the Personal Computer to exchange electronic mail with other TCP/IP-based devices.

The product, consisting of Micom-Interlan's NI5210 data link controller card and the TCP/IP Workstation software, is currently being beta-tested and will cost $795 when available next month.

Micom-Interlan, a subsidiary of Micom Systems, Inc., is located at 155 Swanson Road, Boxborough, Mass. 01719, or call (617) 263-9929.

▶ *ETHERNET-COMPATIBLES*

Cabletron repeater out

Ethernet device supports mix of cables.

EAST ROCHESTER, N.H. — Cabletron Systems, Inc. recently introduced an Ethernet network repeater that can accommodate different types of network cables.

The Multi Media Access Center (MMAC) enables stand-alone Ethernet-compatible computers and small Ethernet work group networks supported by different cable types to communicate.

Port boards in the repeater support nonshielded twisted-pair wire, fiber-optic cable, thin-wire coaxial cable and Ethernet transceivers.

MMAC can be used stand-alone to provide connections among as many as 2,436 devices. As many as four units being used in stand-alone fashion can be daisy-chained together. The new product will also enable a mix of network cables to share a single link to a backbone Ethernet network. As many as 87 of the units can be linked to an Ethernet backbone.

The MMAC comes in two versions: One supports a single, multiport interface board; the other supports up to seven multiport interface boards. The single, multiport board version can be daisy-chained to larger units. Both versions also support an Intelligent Repeater Module.

The Intelligent Repeater Module conforms to IEEE 802.3 repeater specifications. It contains a Central Repeater Unit that monitors all ports and automatically disables bad interface boards. When it is repaired, the Central Repeater Unit automatically enables the port to rejoin the network.

Interface boards available for the repeater include a 12-port model supporting up to 12 nonshielded twisted-pair connections at distances up to 495 feet. Another board supports up to 12 fiber-optic cable connections, at distances up to 1.8 miles.

A third board supports up to 12 thin-wire coaxial-cabled Ethernet segments, each of which can be 660 feet long and can support 29 devices. The last port board supports connections among up to eight Ethernet segments.

The MMAC can be managed using the firm's IBM Personal Computer-based Remote Lanview software. The Personal Computer can be linked to the MMAC via any of the ports or via an RS-232 link. The software enables users to configure the MMAC remotely or locally and gather net usage statistics.

The MMAC comes stand-alone or can be rack mounted. It includes LEDs that indicate overall system status and individual port status.

Depending upon configuration, the cost of the unit ranges from $500 per port for twisted-pair cabling to $900 per port for fiber-optic cabling.

Cabletron Systems is in the Cabletron Industrial Park, 10 Main St., Box 6257, East Rochester, N.H. 03867, or call (603) 332-9400.

▶ *COMPRESSION LABS*

Videoconference system for small sites to debut

BY JIM BROWN
New Products Editor

SAN JOSE, Calif. — Compression Labs, Inc. is expected to introduce this week a videoconferencing system positioned as an entry-level system or as a low-cost means of extending a videoconferencing network to low-volume locations.

The modular Gallery 2000 videoconferencing system consists of cameras, monitors and audio equipment housed in a cabinet. The system works with the firm's Rembrandt or Rembrandt 56 coder/decoders to support transmission of full-motion video, still-frame graphics and voice between remote locations.

The unit includes two 25-inch video monitors. One monitor will display conferees while the other displays documents or other still-frame graphic images.

The unit also has two cameras. The main camera is used to photograph conferees. The other photographs still-frame images.

The system comes with a Shure Brothers, Inc. four-port AMS4000 audio mixer console and three microphones. The audio console includes an echo-cancellation system and supports full-duplex synchronized voice communications.

In addition, the unit features a room controller unit, a stand-alone box wired to the cabinet that enables users to choose camera angles and operate other system functions.

The room controller can operate the camera's zoom lens, focus the camera and aim it from side to side as well as up and down. The controller also contains a mute switch, which kills audio transmission, to enable users to conduct a private conversation while video contact is maintained.

The Rembrandt coder/decoder gives the higher quality video and requires network facilities capable of supporting speeds of 384K bit/sec to 3M bit/sec. The Rembrandt 56 uses 56K bit/sec and 384K bit/sec facilities. The Rembrandt 56 can be used with AT&T's Switched 56 dial-up 56K bit/sec service.

The Gallery 2000 cabinet measures 5 feet, 6⅞ inches tall by 4 feet, 9½ inches wide. The unit is 31 inches deep.

Gallery 2000 is priced at $30,000, and the Rembrandt and Rembrandt 56 coder/decoders cost $68,000 each.

Compression Labs is located at 2305 Bering Drive, San Jose, Calif. 95131, or call (408) 435-3000.

First Look

Cermetek modem with dial-back security debuts

Cermetek Microelectronics, Inc. introduced a 9.6K bit/sec modem featuring a dial-back security scheme.

The firm's **9600S** modem is compatible with CCITT V.32 modem standards.

The security scheme requires users calling into the central-site modem to provide a password and then hang up. The central-site modem will check that password against a list of authorized users to determine from what telephone the user is calling. The central-site modem will then call that number and establish a link with the remote modem.

The modem operates in full-duplex mode via dial-up or two- or four-wire leased lines at speeds up to 9.6K bit/sec. It supports synchronous and asynchronous data. It is also compatible with the Hayes Microcomputer Products, Inc. AT command set and most asynchronous communications software packages.

The 9600S will cost $1,995 and will start shipping in March.

Cermetek Microelectronics, Inc., 1308 Borregas Ave., Sunnyvale, Calif. 94088, or call (408) 752-5000.

Codex modems get new error-reduction scheme

Codex Corp. enhanced its **V.32 Series** modems with a feature that reduces data block errors caused by phase roll, also known as far-end frequency offset. Additionally, the company cut prices for its existing V.32 Series.

The addition of **Phase Roll Compensation** enables the modems to compensate for variations in signal phases of far-end echo. The technique measures the echo signal at the receiving modem against the echo signal at the originating modem and corrects differences in those signals. Differences between those echo signals can result in data errors and retransmission of data packets.

The variation in signals is introduced when different carriers' equipment is used between the originating and receiving sites. The offset is caused by differences in the digital equipment modulation/demodulation process, which results in timing slips, according to Codex.

Codex's V.32 modems already feature several error-correction capabilities, including near- and far-end echo estimation and cancellation, and 32-state two-dimensional trellis coded modulation.

Phase Roll Compensation will be included on all new Codex V.32 Series modems. Codex's existing V.32 modems cannot be upgraded to support Phase Roll Compensation.

Codex also reduced the price for its existing V.32 modems. The single-unit price for its stand-alone 4.8K bit/sec Codex 2250 was reduced to $1,795 from $2,495, while a plug-in card version was reduced from $2,245 to $1,545. Pricing for the stand-alone 9.6K bit/sec Codex 2260 was dropped to $1,995 from $2,545, while the plug-in card version was reduced to $1,745 from $2,795.

Codex Corp., 7 Maresfield Farm, 7 Blue Hill River Road, Canton, Mass. 02021, or call (617) 364-2000.

Amnet enhances its X.25 switch software

Amnet, Inc. recently released a new version of its X.25 wide-area network software.

Version 2.10 of the firm's software will be supplied as a standard feature on new Nucleus 7400 Network Switching Nodes and Nucleus 7900 Network Management Processors. The new software enables network managers to create hunt groups, which are groups of lines sharing a common name. With a hunt group, the Amnet switch will search a group of lines linked to a device and will assign users to the first available line. Earlier versions required each line in the network to be named.

The new software also features an extended frame-numbering plan. The new numbering plan enables the switch to transmit up to 127 frames within the same amount of time it took earlier versions to transmit up to seven frames. The new numbering plan will be useful on delay-prone satellite links, the company said.

The new software also enables network managers to configure a hot-standby node. That standby node will automatically support all the lines connected to a failed primary node. With the software, users are also now able to create Amnet X.25 networks supporting up to 250 nodes. Each of those nodes is capable of supporting up to 264 virtual circuits.

Pricing for the Nucleus 7400 Network Switching Node, including Version 2.10 software, starts at $7,490. The Nucleus 7900 Network Management Processor, which must be used in conjunction with

See **First Look** page 36

A 4:1 TRANSCODER THAT WORKS...
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To find out how the 6441 Quad-Transcoder can provide cost effective T-1 circuit utilization for your application, contact an Aydin representative today.

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*This limited offer for Fujitsu Modem Insurance is only open to new purchases of 19.2 Kbps modems from an authorized Fujitsu America distributor and is subject to the terms of our Modem Insurance Policy.

First Look from page 34

the 7400, costs $19,990. Current users of the products covered under Amnet's software maintenance contract will receive free upgrades to the new software.

Amnet, Inc., 1881 Worcester Road, Framingham, Mass. 01701, or call (617) 879-6306.

Firm releases pocket-sized modem

Delta Computer Corp. introduced a pocket-sized Hayes Microcomputer Products, Inc.-compatible 1,200 bit/sec dial-up modem.

The **Voyager Modem** is capable of operating synchronously or asynchronously in full- or half-duplex mode. It includes 28-character nonvolatile memory capable of storing frequently dialed numbers.

The product also supports autodialing and autoanswering. It features busy- and dial-tone monitoring and supports both pulse and tone dialing. The Voyager is compatible with CCITT V.22 and V.21 recommendations, as well as Bell 212A and 103 modem standards.

The modem operates on power from a nine-volt battery capable of supporting 10 hours of operation. It can also catch errors and resend data packets.

The Voyager Modem costs $99. Delta also offers an alternating current adapter for the modem that is priced at $4.95.

Delta Computer Corp., P.O. Box 809, 260 Forbes Blvd., Mansfield, Mass. 02048, or call (617) 339-5575.

Software enables network to support optical storage

Optical Storage Solutions, Inc. unveiled software that enables optical disk drives ranging in capacity from 122M bytes to 1.6G bytes to be used as net storage devices.

The firm's **OS-DOS 4.0** works with Novell, Inc.'s NetWare operating system to allow an optical disk linked to a network file server to appear to the network as a Winchester hard disk. That link is supported via a small computer system interface.

In order to run the OS-DOS 4.0 software, the file server must support at least 640K bytes of random-access memory, one floppy disk drive and a 20M-byte hard disk. The file server must be dedicated to work only with the optical storage unit. Each NetWare-connected Personal Computer seeking access to the optical storage unit must also run OS-DOS 4.0.

OS-DOS 4.0 includes a standardized Intelligent File System that allows data to be written to all optical disks uniformly, regardless of the attached hardware or optical disk format. It converts basic DOS-based commands to the commands needed to access and store optical disk-based files. With the software, files can have names up to 20 characters long. It supports up to 65,000 subdirectories and files of up to 2G bytes each. The company released a single-user version of the software, dubbed OS-DOS 3.0. It makes the optical storage disks appear as Winchester disk drives to an IBM Personal Computer.

Both packages support 5¼-inch, 8-inch and 12-inch optical disk drives from Optimem, Laser Magnetic Storage International, Fujitsu America, Inc., Maxtor Corp., Pioneer Electronics, Inc., Ricoh Corp., Sony Corp. of America, Toshiba America, Inc. and Panasonic Industrial Co.

A version supporting a 5¼-inch or 8-inch optical disk drive costs $1,250. Support of a 12-inch optical disk drive costs $2,500. OS-DOS 3.0 software costs $937 to support 5¼-inch and 8-inch optical disk drives and $1,875 to support 12-inch optical disk drives.

Optical Storage Solutions, Inc., 1130 D Burnett Ave., Concord, Calif. 94520, or call (415) 825-3441.

Unit supports links to AppleTalk

TOPS, a Sun Microsystems, Inc. company, introduced a device that links Apple Computer, Inc. Macintoshes, IBM Personal Computers and other peripherals to an AppleTalk or Farallon Computing PhoneNet Plus network running the TOPS network operating system.

TOPS released **TOPS TeleConnector,** which supplies the physical link from each microcomputer or peripheral to AppleTalk network cables.

The new device supports TOPS' FlashTalk software. FlashTalk works with the TOPS network operating system to enable IBM Personal Computers to communicate with other Personal Computers via an AppleTalk network at speeds of 770K bit/sec. FlashTalk also enables Personal Computers to communicate with Macintoshes via AppleTalk at speeds of 230K bit/sec.

TOPS offers two types of TeleConnectors. One is designated DB-9, and the other is called DIN-8. Personal Computers and Macintosh 512 and 512e models require DB-9 connectors, while new Macintosh models require a DIN-8. One side of the connector links to the AppleTalk card in the microcomputer,

Thanks, ICA members, for making Network World your best-read communications-oriented publication.

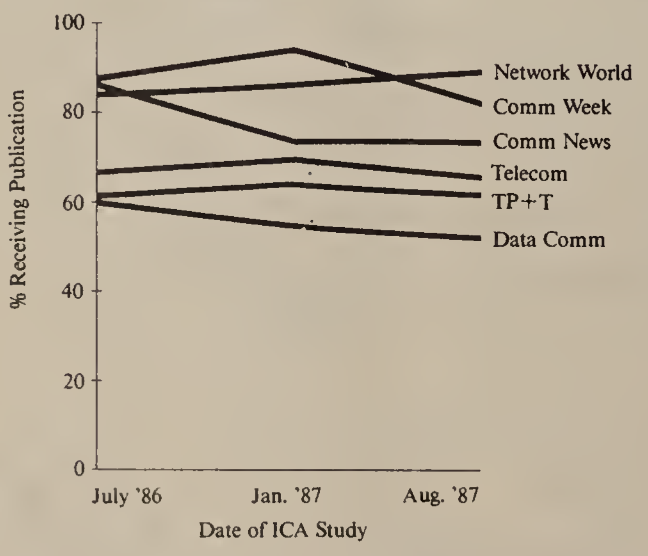
NETWORK WORLD
Gary J. Beach
Publisher

"Rome wasn't built in a day." Although you've heard this saying time and time again, the philosophy behind it — that through hard work you can make things better day by day, week by week, and year by year — remains sound.

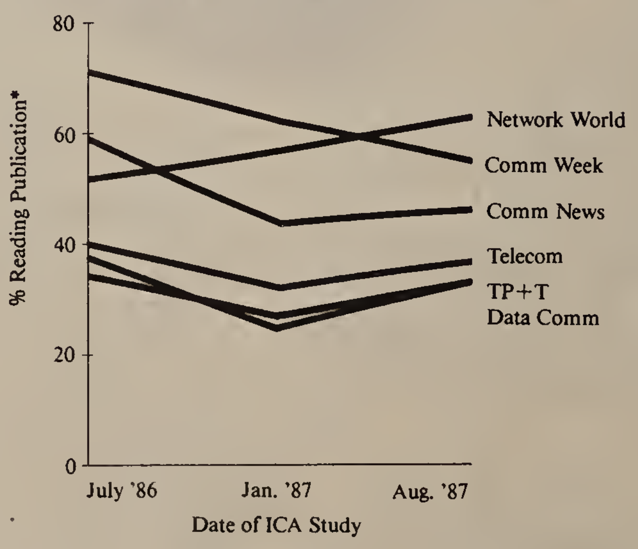
It's this very philosophy that *Network World* editors have followed during the past 18 months. And in doing so, they have remained true to their initial goal: to make each issue of *Network World* the best possible for you, our readers.

Evidence is growing that *Network World's* long-term commitment to editorial excellence is paying off. In fact, the latest study conducted by an independent research firm among ICA members shows rather impressive results. Not only does *Network World* top the list of communications-oriented publications in receivership, but it now ranks number one in readership as well.

As you can see in the following charts, both receivership and readership of *Network World* among ICA members have steadily increased since July 1986. However, during this time period, these same ratings have declined for almost every other communications-oriented publication.



Total Receivership of Communications-oriented Publications among ICA Members



Total Regular Readership of Communications-oriented Publications among ICA Members

* Readership figure for each publication is based on the number of ICA members who receive that publication.
Studies conducted by First Market Research of Boston.

There's no question about it. *Network World's* in-depth networking coverage is what enables us to deliver a unique editorial product that progressive communications users have come to rely on week after week.

Thanks to the growing support of ICA members and continued dedication of all our readers, *Network World* is now the number one communications-oriented publication for today's leading-edge users.

Cordially,

Gary J. Beach

Gary J. Beach
Publisher

375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700
An IDG Communications Publication

while the other side supports an RJ11 jack that links to the twisted pair-wired AppleTalk.

The TOPS TeleConnector costs $59.

TOPS, a Sun Microsystems, Inc. company, 2560 Ninth St., Suite 220, Berkeley, Calif. 94710, or call (415) 549-5900.

Short-haul modem supports T-1 speeds

TeleProcessing Products, Inc. introduced a short-haul modem capable of supporting speeds up to 1.54M bit/sec.

The firm's **TP-235 Modem Simulator** replaces modems and digital data service units/channel service units for transmission over distances up to 4,500 feet. The unit supports communications between V.35-compatible devices.

The basic unit supports speeds of 9.6K bit/sec to 268.8K bit/sec. With a T-1 option, the unit will support additional speeds ranging from 386K bit/sec to 1.54M bit/sec.

The distance the unit will support depends on the speed at which it is used. At 9.6K bit/sec, the modem supports transmission over 4,500 feet. Configured for T-1 speeds, the unit supports transmission up to 2,000 feet.

The product features accessible switches that enable it to duplicate some typical modem configurations. It can be used in continuous- or controlled-carrier systems. It also includes front-panel status indicators and a digital data loopback capability.

TP-235 costs $595.

TeleProcessing Products, Inc., 4565 E. Industrial St., Building 7K, Simi Valley, Calif. 93063, or call (805) 522-8147.

Patch panel includes switching capabilities

Northern Telecom, Inc.'s Spectron Division announced a digital patch panel designed to enable network operators to switch a connection from an out-of-service device to a backup.

The **Universal Digital Switch/Patch (UDSP)** can be used to support terminal-to-host connections. It also supports connections between pairs of modems and pairs of multiplexers, and it enables two peripherals to share access to a single data line or computer port alternately. Up to 16 cards supporting RS-232, V.11, V.35 and X.21 interfaces can be housed in the same patch panel.

The product enables a network operator to switch a terminal from an out-of-service host port or modem to a backup host port or modem. It also enables the network operator to select which of two peripherals will be able to access a data line, and it allows the network operator to access remote components or peripherals for test purposes.

The product features an optional series of integrated alarms. Each data line connected to the UDSP rack can be individually configured to alarm any one of 16 leads. Built-in alarm lamps eliminate the need for an external alarm panel.

The company also released a **Remote Switch Controller.** That product enables a network operator to access and control up to 64 remote UDSP racks from a single microcomputer or VT100-compatible terminal.

The microcomputer or VT100 terminal links to the controller via an RS-232.

The typical price for a rack supporting 16 interface boards and a power module is $5,100.

Northern Telecom, Inc. Spectron Division, 8000 Lincoln Drive E., Marlton, N.J. 08053, or call (609) 596-2500.

Digital microwave radio supports 32 DS1 channels

Granger-Telettra debuted a 6-GHz digital radio that supports transmission of up to 32 DS1 channels.

The **DTR 6** is designed for low- and medium-capacity backbone and spur applications. It can operate in a point-to-point network or in a multipoint network supporting an integrated radio and fiber-optic communications system.

The radio broadcasts in the 6.525-GHz to 6.875-GHz bandwidth. Its transmitter generates a half watt of power and requires 24-volt or 48-volt batteries. An alternating current power source option is also available.

Used in a point-to-point network, the radio works with Granger-Telettra's 45M bit/sec DTM 45R multiplexer, which provides the radio orderwire and service channel access in addition to multiplexing functions. The radio transmits the DTM 45R's composite link.

Used in multipoint networks, the radio works with the firm's 45M bit/sec DTI 45R drop-and-insert multiplexer. A DTI 45R at each site is capable of extracting DS1 channels from the overall DS3 data stream and inserting other DS1s destined for other points on the network.

The radio is supplied with a hot-standby transmitter that will automatically begin broadcasting when the primary transmitter fails.

The DTR 6, including the multiplexer, costs about $34,000.

Granger-Telettra, 3101 Scott Blvd., Santa Clara, Calif. 95054, or call (408) 727-3101.

Data analyzer software released

Northern Telecom, Inc.'s Spectron Division unveiled a new set of applications to run on the company's Datascope 2000 portable data analyzer.

The **Datascope 2000 Applications Library** is a collection of general applications and protocol-specific tests, distributed on diskettes, which are designed to help data center technicians troubleshoot network problems.

Four test packages are available now: a standard application package, a 3270 BSC Exerciser package, a 3270 SNA Exerciser package and an X.25 Exerciser package.

The standard application package contains 13 programs, including programs designed to test request to send and clear to send delay. The package also includes an 81-character printer test.

The 3270 BSC Exerciser package contains four programs designed to test interactively an IBM 3270 or compatible cluster controller and the terminals attached to that cluster controller in a network supporting IBM's Binary Synchronous Communications protocol.

The 3270 SNA Exerciser package contains 16 programs that also interactively test an IBM 3270 or compatible cluster controller and its attached terminals supporting IBM Systems Network Architecture protocols. The package enables a central site network operator to establish a link with a specific logical unit and create a session that enables data to pass from the host to the remote device.

The X.25 Exerciser package contains four programs designed to verify the link and packet levels of any data terminal equipment-configured device using X.25.

The standard application package is supplied free of charge with the Datascope 2000. The other three packages are available for $50 each.

Northern Telecom, Inc. Spectron Division, 8000 Lincoln Drive E., Marlton, N.J. 08053, or call (609) 596-2500.

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Opinions

STRATEGIC ALLIANCES

JEFFREY KAPLAN

Survival of the fattest

As 1987 came to a close, the surge in strategic alliances seemed to reach a new high. Large companies gobbled up small ones. Computer companies acquired communications companies. And competitors combined with one another. What's more, 1988 should be a continuation of this feeding frenzy.

What has made one-time competitors turn into compatriots? How can former archrivals become bedfellows? It can all be traced to one simple issue — survival.

Smart companies are recognizing that market dynamics are changing. Engineers with innovative ideas and entrepreneurial ambitions are opening generation after generation of new companies in hopes of fame and fortune. The number of companies competing for finite opportunities is growing.

Differentiation becomes more difficult to establish and maintain. Customer loyalty can no longer be assumed. And price competition puts added pressure on profit margins at a time when companies must invest in more marketing, added research and development, and better customer service.

At the same time, users are looking to reduce the number of suppliers they have to deal with on a day-to-day basis. Users are looking for vendors with broader product lines and more sophisticated technical skills.

Fewer and fewer companies can survive entirely on their own in this type of environment. Strategic alliances are certainly not a new phenomenon. Companies have always worked together, and OEM agreements, joint marketing arrangements and cooperative development deals have been a part of the industry for a long time as well. What makes the current activity different is that vendors are being forced to find strategic partners to ensure their long-term survival, not just to enhance their positions in the marketplace.

The changing requirements of users are a key force behind this trend. Users have shifted their energies away from the rapid procurement of communications equipment, which characterized the 1983-to-1986 period, to a consolidation effort aimed at more effectively utilizing the facilities that have been installed.

Systems integration of multivendor networks is the top priority for major users. Fortune 1,000 companies and government agencies are looking for suppliers with products and skills that will transform their communications networks into corporate assets.

A key ingredient in this transformation process is the network management system. Users are no longer satisfied with systems that can manage only isolated elements of the network, such as modems or multiplexers. They are looking for systems that will oversee broader segments of their facilities.

The skills necessary to integrate systems and to produce sophisticated network management systems cannot be provided by a small, specialized supplier. As users demand local-area network/wide-area network integration, companies that aimed at solving users' local- or wide-area net needs are hard-pressed to meet larger requirements.

Strategic partnering, therefore, is not a luxury but a necessity for survival in this changing marketplace. Users that expect a vendor to address a broader range of networking issues should carefully assess its ability to respond to this challenge. Users should be skeptical about a vendor's ability to expand into new areas if that vendor lacks the necessary resources.

Users should look to companies that are realistic about their abilities to address all of their networking needs. Companies that have already established joint agreements with other suppliers are acknowledging that they cannot satisfy all of the customers' needs and are willing to work with other vendors to get the job done.

Mergers and acquisitions can create confusion and continuity problems for users. It took IBM and Rolm Corp. three years to produce a new private branch exchange. And in the meantime, Rolm's ability to support existing customers was sorely tested.

Users should expect more strategic alliances in 1988. The continued growth of this trend will require that users spend even more time evaluating the strengths and weaknesses of their suppliers. In this way, users will be able to anticipate possible changes in the way vendors do business.

Kaplan is director of communications industry research at International Data Corp. in Framingham, Mass.

IBM STRATEGIES

SHERRY GEDDES AND MAXWELL STEINHARDT

More bricks in the wall

There is a Machiavellian element to the strategy underlying all of IBM's seemingly fragmented, uncoordinated networking activities: They are all elements of IBM's plan to control data networking in the 1990s.

That plan is still evolving, and full implementation is a few years away, but the critical pieces are in place. IBM is showing that it has learned the dynamics of networking and that it intends to dominate networking just as it currently dominates data processing.

The magic formula in the past was secrecy: Use proprietary hardware and software to keep the system closed to outsiders. The magic formula for the 1990s is openness: Make it easy for everyone to connect with IBM.

Why? Because the larger networks grow, the greater the demand for what IBM sells — processing power — which is used to control mainframe data bases, network management, mixed vendor integration into Systems Network Architecture and so forth. Instead of trying to own 100% of the old DP pie, IBM now aims to own 100% of the core of corporate networks, SNA, and major pieces of the action at every other level, from the physical connection to the application.

The beauty of the strategy is its simplicity. By providing logically horizontal, functionally vertical products and services, IBM will drive demand for its products and services. Every time a vendor sells a departmental local-area network or a bridge to an IBM SNA or Token-Ring Network, the need for integration with the corporate network, the requirement for management and the processing load all increase, paving the way for IBM sales.

While the world argued about wiring schemes and standards, IBM quietly laid the foundation upon which it could build a wall around data networking, much like the fortresses of the Middle Ages. In those days, vassals had to give up some percentage of their harvest to gain the protection of a fortress.

When its networking fortress is fully constructed within five years or less, IBM, like a feudal lord, will reap a percentage of every technological harvest. IBM will set critical standards, field many products, provide crucial systems integration expertise and control network management.

At the base of the IBM fortress is the Token-Ring Network, into which all non-IBM networks can connect. Its current 4M bit/sec speed will be increased to 16M bit/sec within 18 months to accommodate high-speed engineering and scientific applications. Within about two years, a 100M bit/sec, Fiber Distributed Data Interface-based fiber version will be announced.

Numerous vendors already offer Ethernet bridges to the Token-Ring, and Transmission Control Protocol/Internet Protocol bridges are also becoming available. Third-party connections into SNA are being curtailed by the withdrawal of specifications for critical interfaces such as PU 4 and 5. In the future, third-party connectivity into SNA will be through the Token-Ring.

At the interface level, IBM is providing Advanced Program-to-Program Communications, APPC/PC and Low Entry Networking and is evolving APPN for the midrange. New network control programs now in the works will

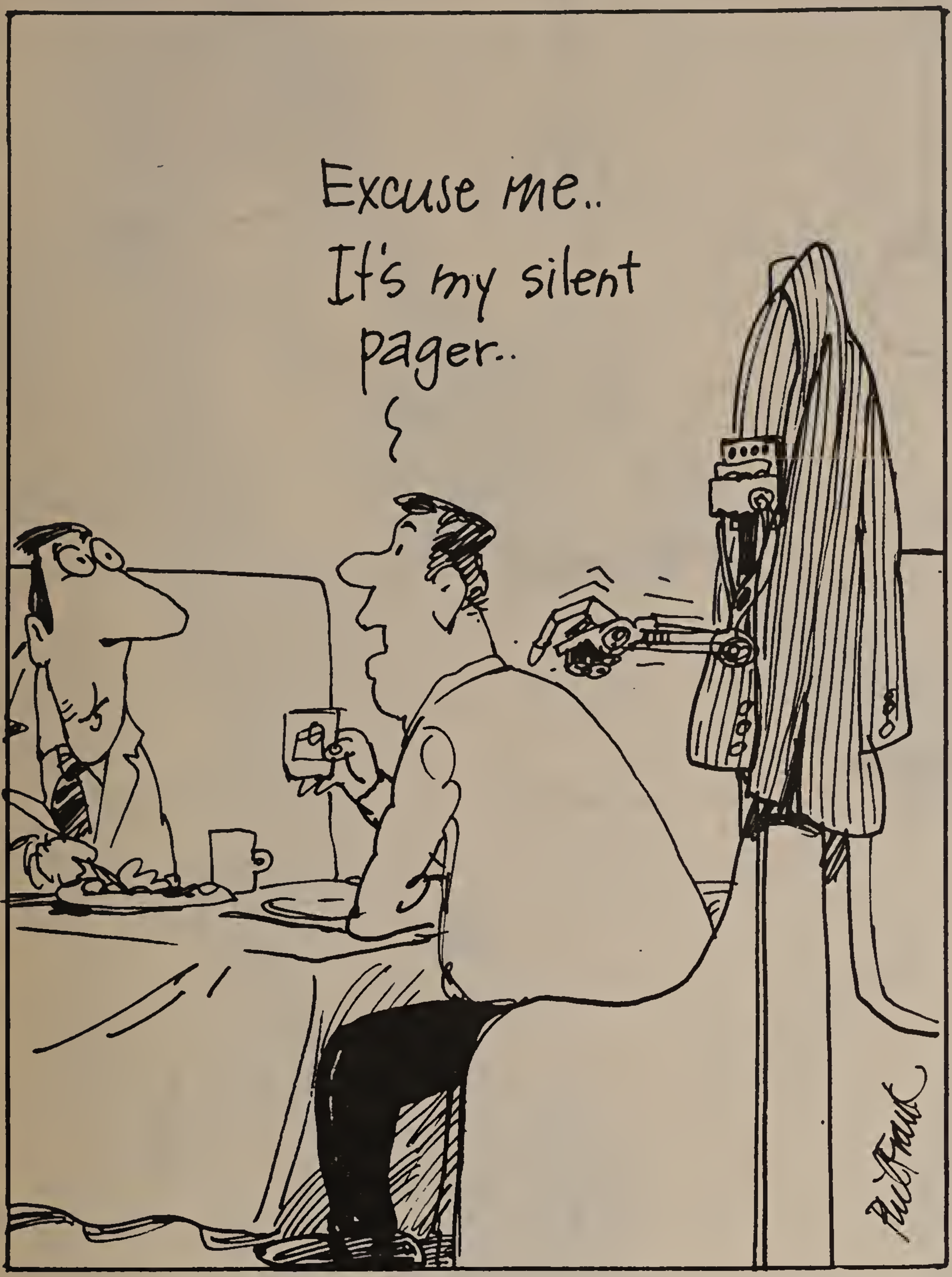
Geddes and Steinhardt are managing partners of CTPS, Inc., a voice and data communications consulting firm in Mountain View, Calif.

If there is anyone who can show just cause why his or her opinions on timely industry issues should appear in *Network World*, speak now; never hold your peace.

Manuscripts must be letter quality, double-spaced and approximately 700 words in length. Disk or modem submissions are preferred.

Contact Steve Moore, features editor, *Network World*, Box 9171, Framingham, Mass., 01701, or call (617) 879-0700, ext. 732.

TELETOONS — By Phil Frank


Excuse me..
It's my silent pager..

utilize these interfaces and encourage third-party development. The OS/2 operating system, especially the Extended Edition, will further cement IBM's hold at the personal computer level. The common interfaces now being defined for SAA will facilitate communications between IBM and third-party developed systems.

As IBM's own systems are reconciled through Systems Application Architecture, this will extend the base of systems that can use an application and make development of network applications more financially attractive to IBM and its Applications Software Division (ASD)-sponsored third parties. The activities of ASD will result in creation of a large body of net applications within two to four years.

As networks expand and applications become more sophisticated, requirements for integrated network management will grow phenomenally — a scenario IBM will capitalize on with NetView for pure IBM shops and NetView/PC for mixed environments. Local control through NetView will be improved, as will mid-range links allowing System/3X equipment to function in traditional mainframe roles for smaller networks.

IBM's Federal Systems Division and Computer Systems Integration groups will be reorganized to create a single division dedicated to providing systems integration for large accounts — IBM's bread and butter.

The Information Systems Investment Strategies Program is a so-called free service for IBM's largest accounts that analyzes an account's technology investments relative to other firms in the same line of business and recommends additional equipment "investments" to "improve competitiveness." This "service," traditionally provided by independent consultants, is unprecedented in the industry.

IBM's most experienced sales teams are becoming privy to highly confidential, critical account data concerning current installed base and planned expansion. They are then being trained to leverage that knowledge into IBM sales.

IBM's approach to networking may appear to be fragmented, but as the foregoing clearly demonstrates, there is a method to the madness. Having recognized the vast profit potential of data networking, IBM is now positioned to convert that potential into bottom-line results — and to reshape the industry in the process. ◘

NETWORK WORLD EDITORIAL

Deregulate consultants

Just what is a consultant? This is a highly controversial question that has direct consequences for users. The matter is most highly focused among the ranks of the Society of Telecommunications Consultants (STC).

Throughout the past year, two STC factions have wrestled over a definition, and one has finally won an uneasy, unsatisfactory victory.

STC members were asked whether the definition of a consultant should be broadened to allow consultants to sell products such as software to clients, and whether a different membership category should be created that would allow independent consultants to remain "pure" while the other category would include seller/consultants.

The situation is complicated by questions about whether sales activities, if approved, should also include telecommunications hardware and how the STC will determine when a member crosses the line from being an independent consultant providing a service to becoming a vendor providing goods.

Meeting at the 1987 International Communications Association conference in New Orleans in May, members were so evenly divided on the topic that it was temporarily decided to allow the sale of certain types of software. This included software that members developed themselves. Sales of such software were not to exceed 10% of a consultant's annual revenue.

When the matter came to a vote again at STC's fall meeting later in the year in Quebec, even limited software sales were banned.

As a result, STC members who continue selling software will be asked to resign from the main body of the STC. They will, however, be allowed to join the group's vendor advisory council.

Nobody really wins in this situation. Consultants dropped from STC's ranks lose a valuable accreditation that may open doors to future business. Consultants who remain "pure" may hamstring themselves by limiting the scope of their services.

Most importantly, users stand to be shortchanged because an artificial distinction prohibits them from making the fullest possible use of consultants.

Given this impasse, what to do?

The time has come to deregulate consultants. Let them offer whatever services and products they wish. There are compelling reasons for such a change.

Users who wish to employ consultants must be able to do so with the knowledge they will be getting no-holds-barred performance. This industry demands nothing less.

Further, many communications consultants are not STC members and are not bound by its strictures. No hue and cry has been raised over any allegedly nefarious activities on their part. It should be noted that the ranks of these non-STC types include some very well-known consultants who are also considered highly ethical.

Freed from the bonds of "purity," consultants will naturally gravitate toward more sophisticated services, which are likely to engender a more competitive marketplace for their talents. Some purists who don't move ahead will be left behind. This is a regrettable by-product of progress. Despite it, increased competition should mean higher quality for users.

Wholesale deregulation calls for safeguards. To avoid hidden conflicts of interest, there must be full disclosure of vendor ties before any services are rendered. This may be referred to as the "Open Kimono Factor."

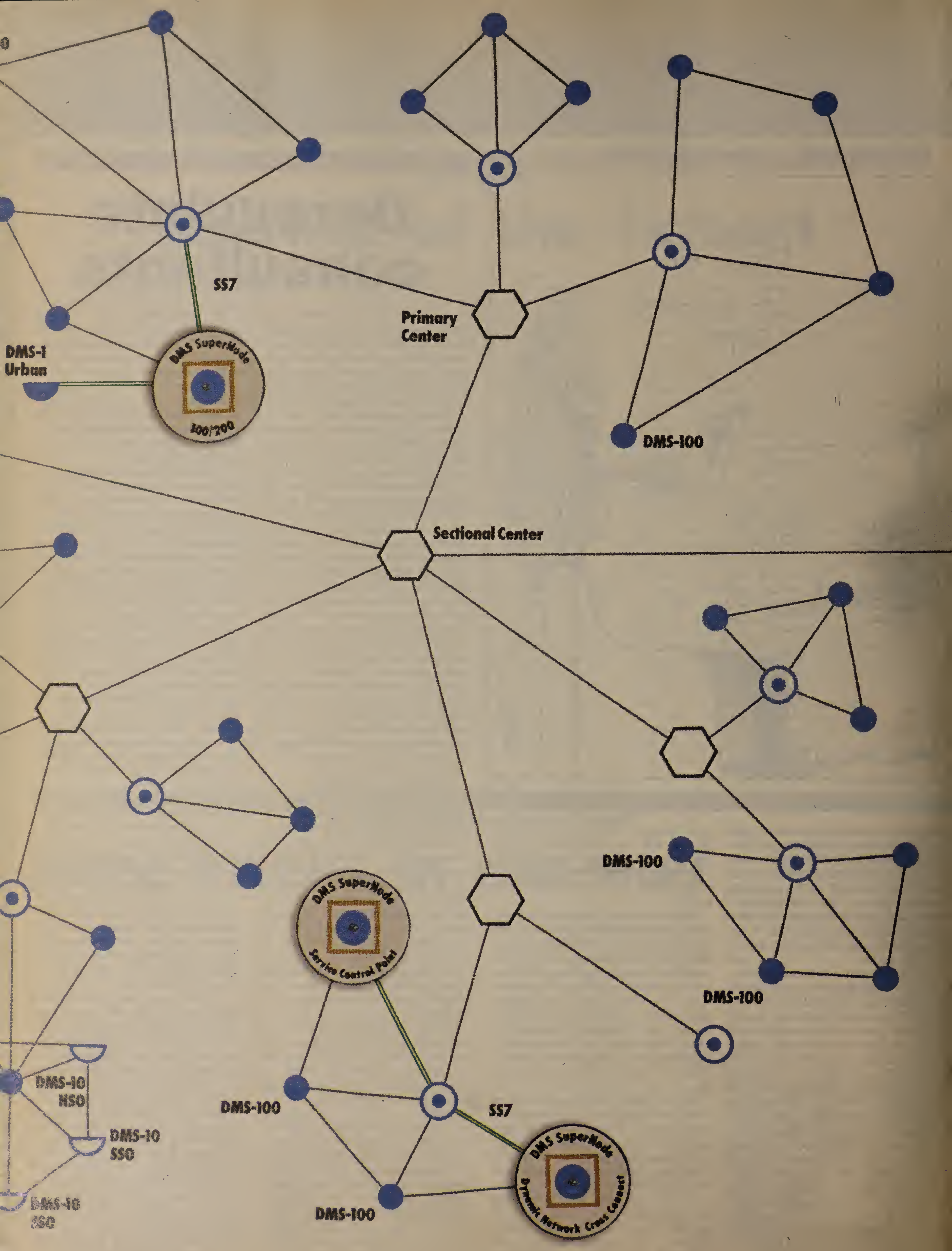
It's up to users to investigate the veracity of consultants' full disclosures. In the end, unscrupulous practitioners will fall victim to their own sullied reputations. Call this the "Sleaze-Seeks-Its-Own-Level Factor."

Deregulating any industry is a frightening thing. There will always be good and bad results. AT&T laid off a lot of people in order to survive. Lots of users ended up high and dry without Ma Bell. But competition flourished, and innovative new companies have formed and thrived.

Deregulation hasn't been perfect, but it has been a step in the right direction.

When you get right down to it, the emancipation of consultants is going to happen anyway. Why continue to put up artificial barriers?

Just as opponents of home video taping and digital audio tape were doomed from the beginning, those who now oppose unlimited consulting services will also see their arguments diminish and disappear. ◘



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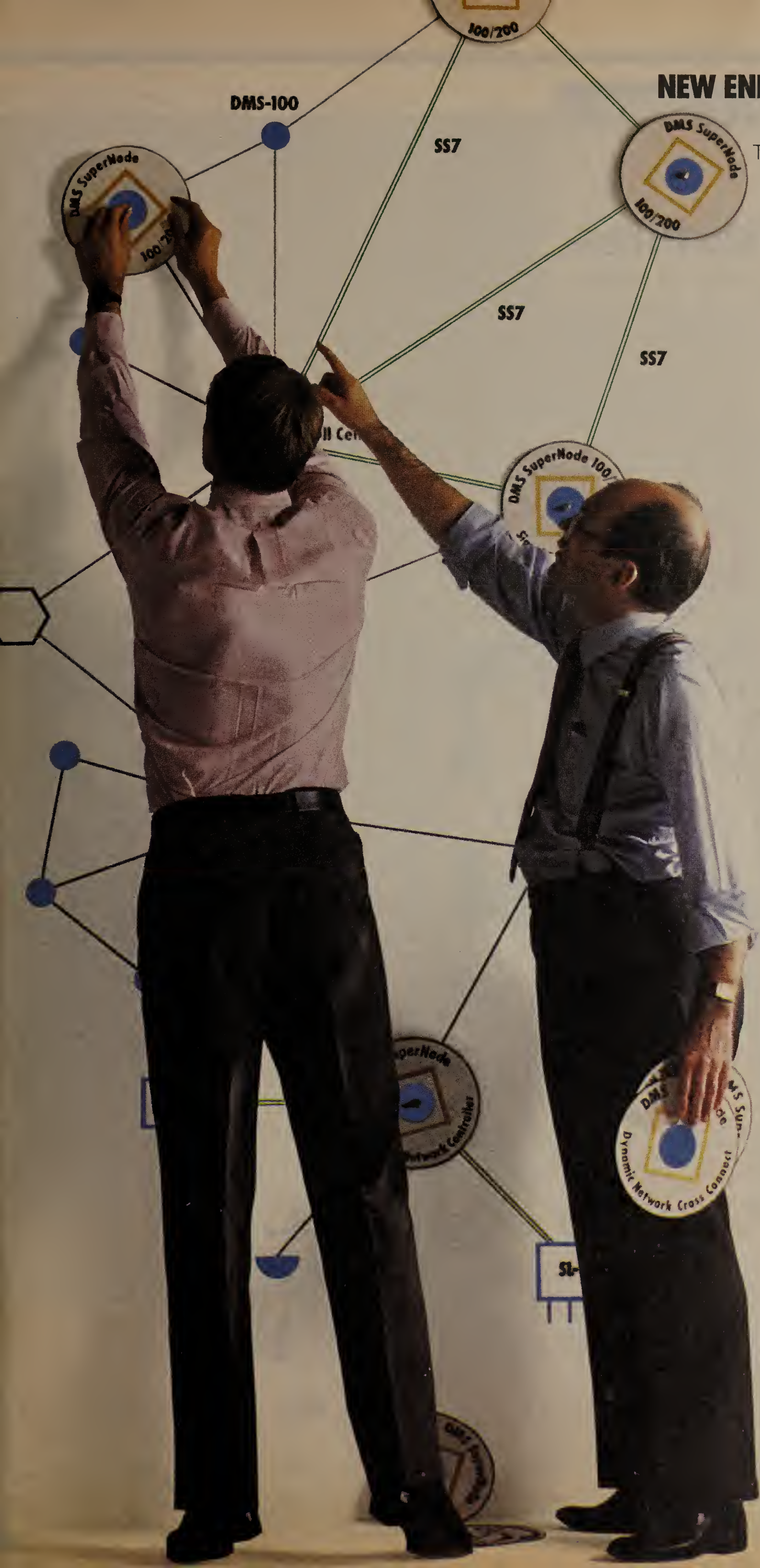

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Unmatched processing capacity gives you power to meet the demand for advanced network services such as Meridian Digital Centrex, 800 Services, private virtual networking and ISDN services.

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NETWORKING

NETWORK WORLD

Features
January 25, 1988

▶ *EDUCATIONAL NETWORKS*

T-1 goes to college

BY JAMES R. HILL
Special to Network World

Each semester in Dallas County, some 100,000 students head for class at one of the district's seven community colleges. The colleges ring the periphery of the county, providing easy access to education for all residents.

These days, students and staff of the Dallas County Community College District (DCCCD) also have access to an integrated data network, digital voice and video teleconferencing and instruction, all thanks to a recently completed countywide network.

This countywide, software-defined T-1 network integrates voice, data and video over microwave and fiber.

One of the first software-defined educational networks, it uses microwave, fiber optics, digital cross-connect and T-1 technology to provide one common digital pipeline to nine district locations.

Designed by consulting engineers of Austin, Texas-based Diversified Communication Engineering, Inc. (DCE), the project included planning and installation of new digital switches for voice, a packet-switched wide-area network for data needs and compressed video coder/decoders to be used for video teleconferencing and instruction.

Installed and operational by May 1987, the network has an anticipated life span of 8 years.

Defining the problem

As early as 1984, it was clear that a network redesign was needed. Costs for voice and data services had increased 40% over the previous three years to $1.2 million annually. The cost of airtime for telecourses, which were distributed by a local public television station, was $175,000 and increasing every year.

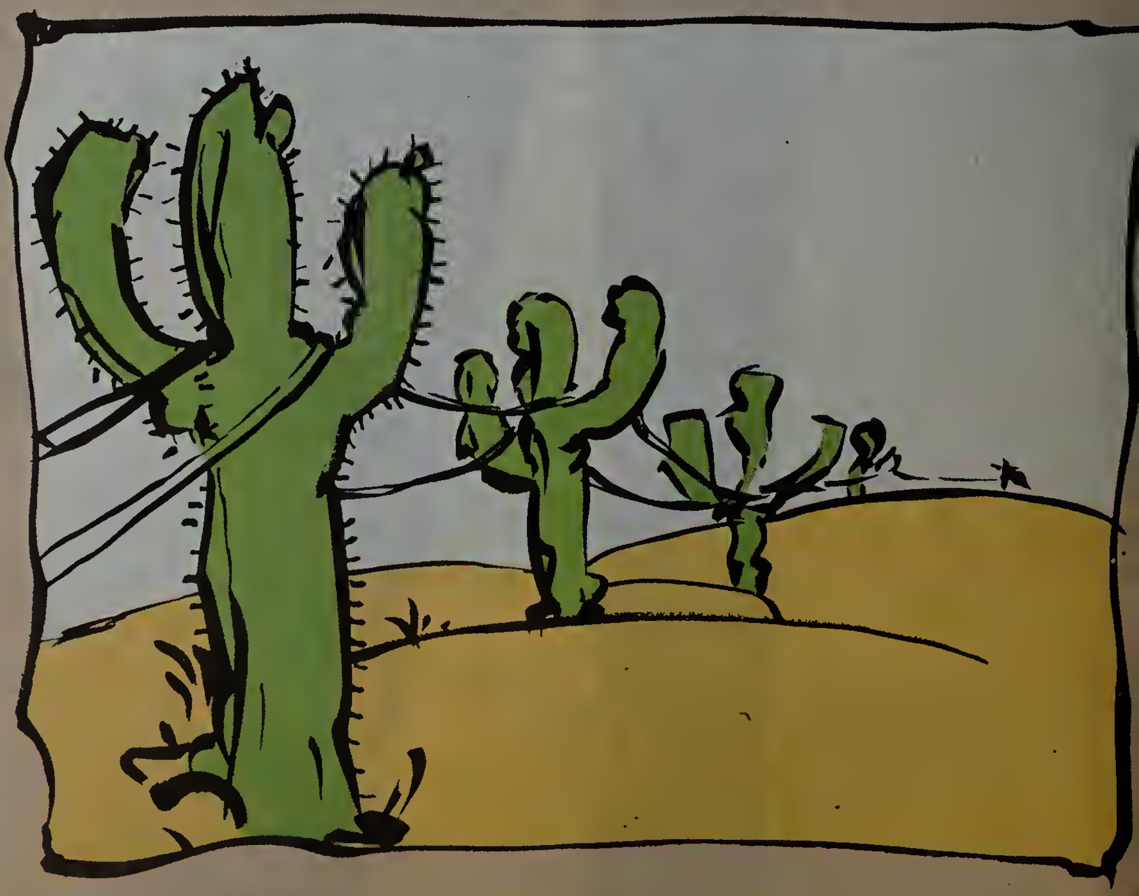
Two colleges needed expansion of their data communications facilities. And throughout the district, office automation was becoming a priority.

At the time, voice communications was managed by the district's facilities division and data communications by the computer services division. Voice switches on each campus, leased from AT&T, were due to expire in July 1986, and price increases were anticipated. Circuits ran between each campus and the central computing center in the District Service Center.

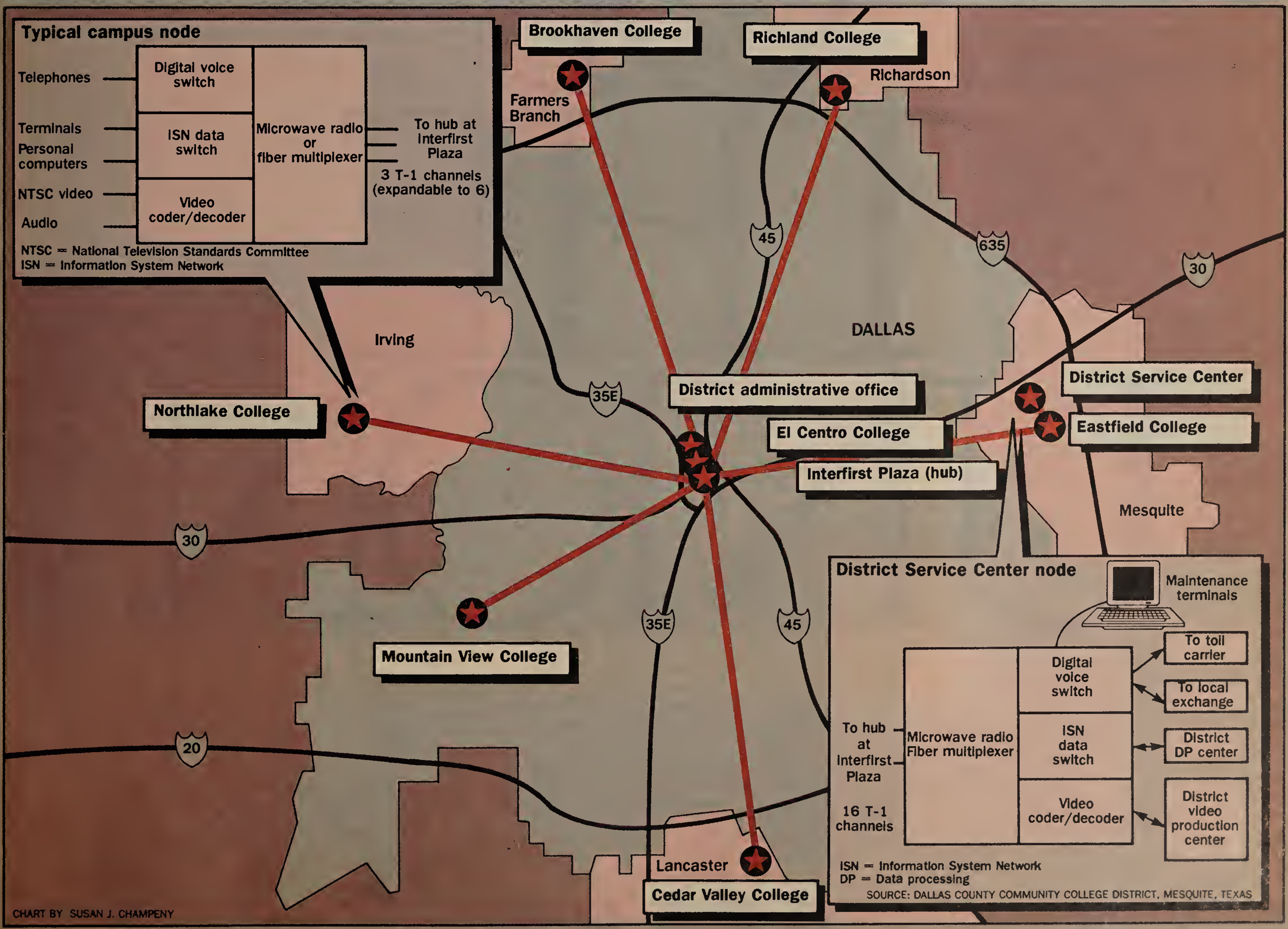
The expiration of the private branch exchange lease, the projected increased demand for data com-

Continued on page 45

Hill is director of information technology for the Dallas County Community College District.



Dallas County Community College District communications network



SOURCE: DALLAS COUNTY COMMUNITY COLLEGE DISTRICT, MESQUITE, TEXAS

CHART BY SUSAN J. CHAMPENY

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western union

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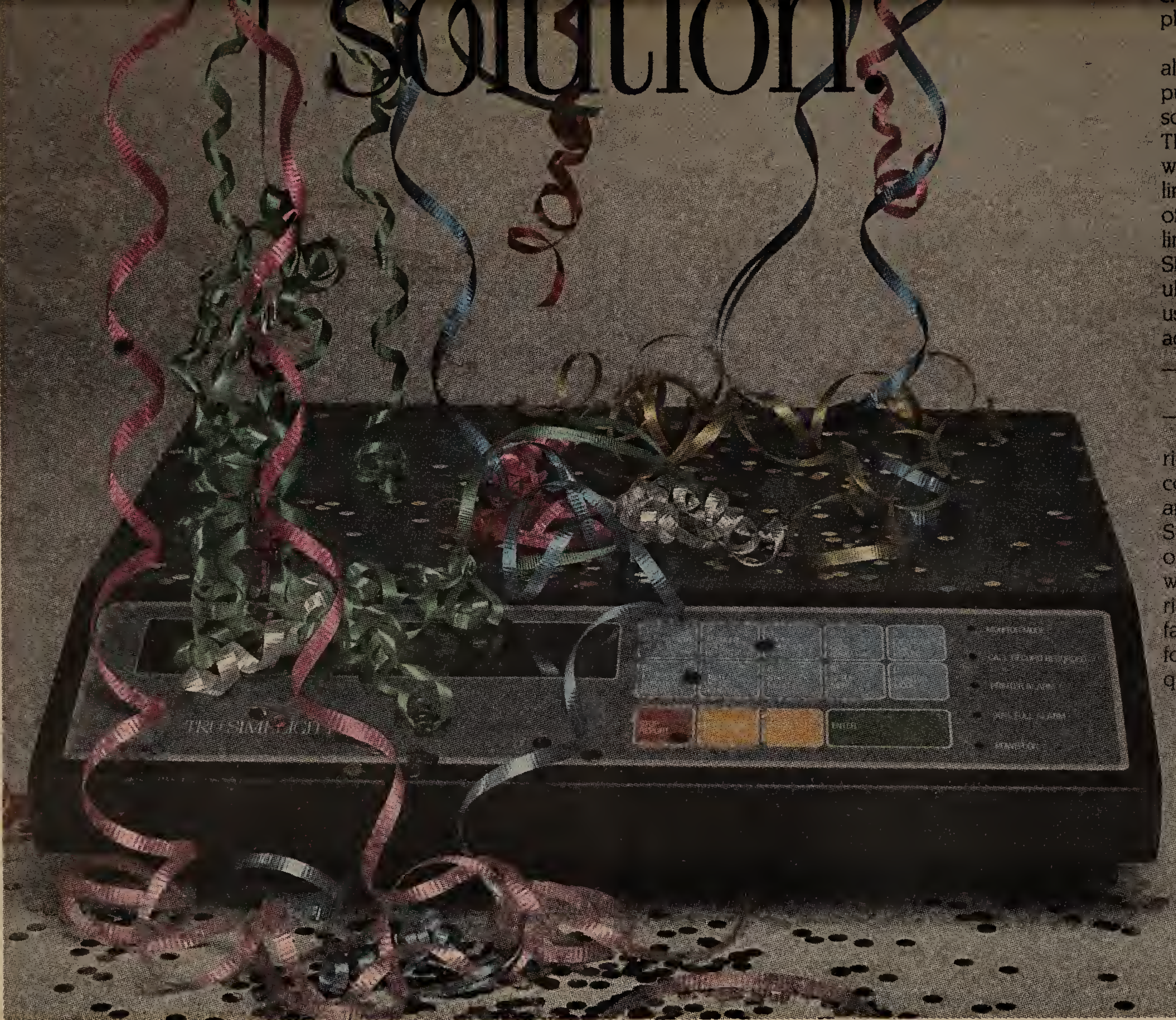
Solution.



phone expenses.

TRU SIMPLICITY is a complete, stand-alone call accounting system; a special purpose computer that offers a host of sophisticated call accounting features. TRU SIMPLICITY gives organizations with as few as 15 and as many as 250 lines an advanced, yet affordable means of efficiently monitoring and controlling their telephone expenses. And TRU SIMPLICITY is engineered to be the ultimate in simplicity of installation and use, distinguishing it from traditional call accounting systems.

Requires No Special Training or Computer Experience

No special training, no previous experience with either computers or call accounting, and no additional personnel are needed to set-up and operate TRU SIMPLICITY. It requires no more space or power than the standard office typewriter, and easily accommodates a variety of standard computer printers. The faceplate features a 4-line LCD display for easy-to-read menus and prompts, to quickly guide the user through the use

continued on page 6

From page 42

munications and telecourses, and the need to contain costs triggered a new strategic approach and the merging of technologies.

Developing the strategy

In July 1984, after serving as director of computer services, I became director of a new division, named information technology, responsible for all data, voice and video communications. I was also named chairman of a districtwide commission formed to examine the district's communications needs and to develop a long-term strategic network plan.

The Communication Network Planning Committee met for the first time in September 1984 with members representing all campuses and district offices, including a college president; vice-presidents in charge of instruction, students and business; faculty members; and directors of purchasing and facilities. Committee members were charged with meeting with their respective campus administrative staff or district office administrative staff to analyze present and future communications needs.

It soon became obvious that the complexity of the task — integrating voice, data, video and image scanning — necessitated the hiring of a consultant. In May 1985, the district selected DCE. In June, the committee met with Saleem Tawil, president of DCE, and Carmen Armistead, an associate in the firm. Both were licensed electrical engineers, which proved to be important in later procurement and implementation.

During the next four months, the committee, with assistance from DCE, developed the following strategic objectives:

- Provide control over resources for services and costs.
- Develop an integrated network for voice, data, video and image scanning.
- Accommodate needs for the next eight years.
- Use new technologies, but with restraint (any systems proposed must have been operational at least one year).
- Provide centralized resources for network control and support.
- Adopt digital switching technology.
- Require a reasonable payback period.
- Provide for video teleconferencing.

Tawil then provided a written report to the committee with his recommendations for a strategic plan. The report included the design criteria for new systems, a financial and cost-benefit analysis for each element of the proposed system, and options and alternatives with appropriate results and sequences. DCE's recommendations were adopted by the committee and approved by the board of trustees in November 1985.

The strategic plan

The foundation of the plan was a software-defined, integrated digital network providing voice, data and video communications between all district locations. The campus locations within the county provided an ideal environment for a star-design microwave network (see diagram on page 43). Interfirst Plaza, a 72-story building across the street from the El Centro campus, offered a direct line of sight to all campuses and was the logical choice for the physical network hub.

Digital switches would be placed at eight sites, with the district office sharing the El Centro switch. Data communications would not use the voice switches but would be accommodated by multiplexers or local-area networks connected by the digital network to the main computing facility at the District Service Center.

While the physical hub was at Interfirst Plaza, the control of the entire network was placed at the District Service Center 10 miles to the east. The key to this arrangement was a Digital Access and Cross-Connect System (DACS) switch that was placed on top of Interfirst Plaza. The DACS' purpose was to gather all the incoming voice/data traffic from the campuses and district offices and drop-and-insert the T-1's 24 64K bit/sec digital channels to the appropriate outgoing 64K bit/sec channels. Video signals would be connected via digital coder/decoders to T-1

The campus locations within the county provided an ideal environment for a star-design microwave network.

Continued on next page

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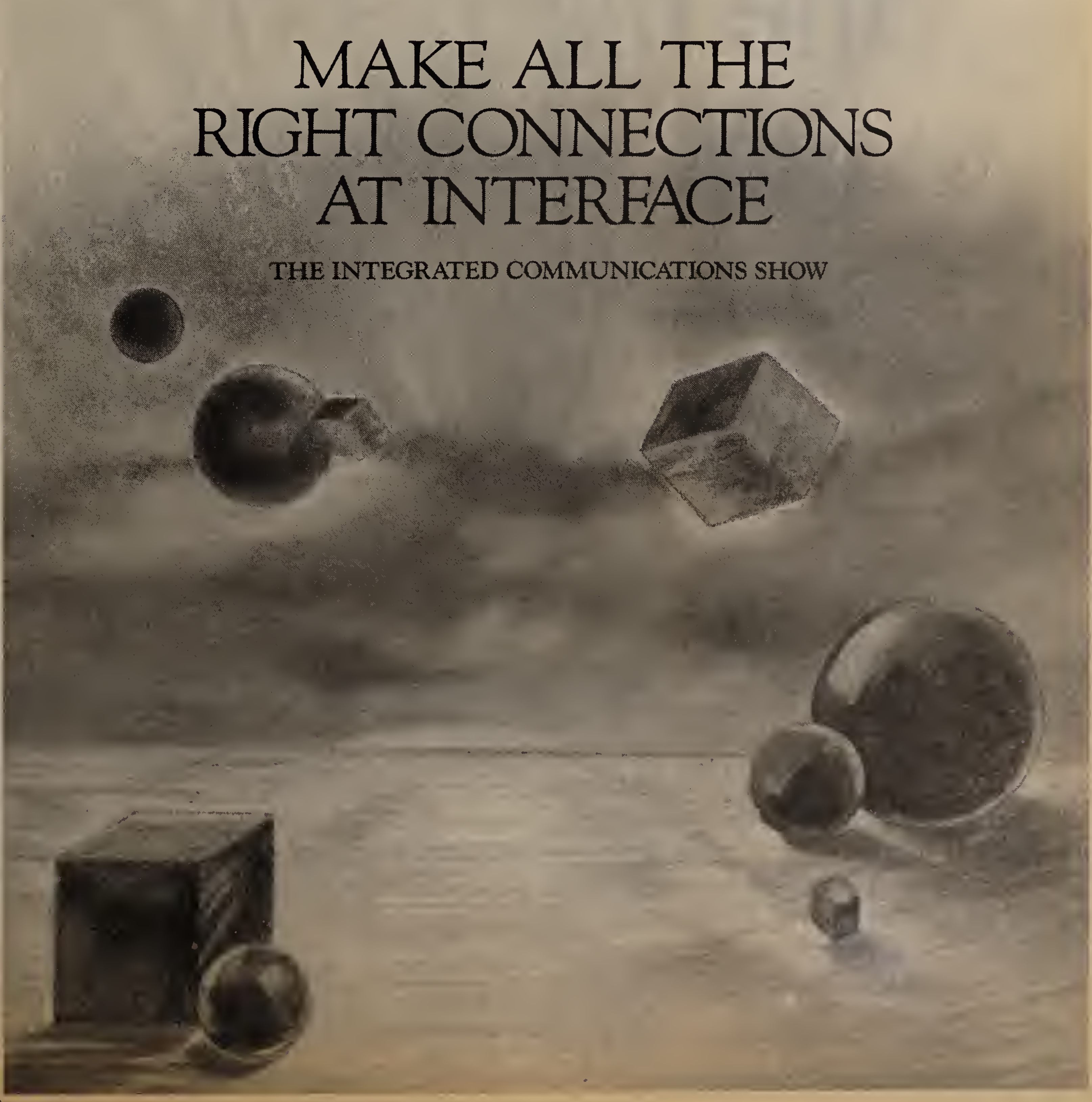

From previous page

channels and routed from origin to destination. The DACS would act as a "big switch in the sky" and would be remotely programmable from the District Service Center so that routing patterns could be changed to suit the district's needs.

The capacity between the eight locations and the hub at Interfirst Plaza was designed to handle six T-1 channels, which comprised 24 64K bit/sec channels for voice and data, or one video channel. Sixteen T-1 channels were designated for the route between Interfirst Plaza and the District Service Center to accommodate the heavy data traffic to the computing center, the detail recording of switch traffic and the long-distance traffic being centralized at that site.

Five campuses and the District Service Center were to be connected to the hub by microwave. The downtown district administrative offices were connected to the El Centro campus with fiber for the data communications network and twisted-pair cable for the telephone, both running under the street. Fiber cable would then run under the street to connect El Centro to Interfirst Plaza. The Eastfield campus would be connected to the District Service Center via fiber cable and then routed over microwave to the hub.

The plan also called for acquiring a low-power television license and an Instructional Television Fixed Service (ITFS) license to replace reliance on local public television and meet future video instructional needs for students and businesses in the county.

A 1985 study indicated a strong demand for automating office support functions at the colleges and at the district offices. Thus, the strategic plan included the procurement of hardware and software to accommodate more than 500 IBM Personal Computer workstations to utilize the integrated digital network.

The workstations would be multifunctional and would use standalone microcomputer software. Connected together for office support functions, they would support word processing, electronic mail, calendaring and scheduling, and document storage and retrieval. Using terminal emulation, the workstations would interface via the network to the mainframe computers at the District Service Center.

Buying it

Specifications for the digital switches, microwave and DACS were developed by DCE. The office support hardware, software and local data network specifications were prepared by DCCCD staff. A two-phase sealed bid process was initiated in February 1986. The first phase was designed to qualify prospective vendors and select finalists. The prebid conference was attended by 28 vendors.

Five finalists — AT&T, General Telephone Co. of the Southwest, Southwestern Bell Corp., Telplus Communications and Universal Communication Systems, Inc. — were chosen for the communications network. Two finalists — Data General Corp. and Digital Equipment Corp. — were selected for the office support system from the 17 vendors that responded to the request for proposal.

The finalists were asked to make half-day presentations to an evaluation committee to demonstrate their understanding of the project, their organizational experience and their commitment at the local level to successful implementation.

Following the presentations, sealed bids were again submitted by the finalists. General Telephone of the Southwest was selected as the general contractor for the communications network. Its bid included NEC Corp. 2400 digital switches, Harris Corp.- Farinon Division microwave and Rockwell International Corp. DACS. The company was chosen because of its proven experience in installing complex systems and the depth of their local support organization.

AT&T's Information System Network (ISN) was chosen for the wide-area network. This network would connect more than 500 IBM Personal Computers with twisted-pair and fiber cable through packet-switched nodes at each campus or office to a central minicomputer at the District Service Center.

Administrative and educational data communications would continue to use multiplexers for the near term, but those areas would be added to the ISN in the near future.

DG was selected as the office support vendor using an Eclipse MV/20000 minicomputer and CEO (Comprehensive Electronic Office) software. The proposed network was approved by the DCCCD board of trustees in June 1986.

The implementation

Implementation began in June 1986 with biweekly planning and progress meetings between the contractors, DCE and DCCCD personnel.

Network construction began in August, and the first two switches were cut over in September. The remaining switches were installed in late 1986, with the exception of

CASE Announces the Merger of IBM and DEC

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. . . and Prime and Tandem. With CASE DCX Communications Processors, the Universal Workstation becomes a reality. The DCX made it possible for CASE to install the world's largest private data communications network—with over 100 computers driving 35,000 terminals in more than 70 countries. Now, DCX modularity can serve your network. Whether it's worldwide or as small as a four-channel, point-to-point system—and regardless of hardware!

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Columbia, Maryland 21046-1199.

CASE

El Centro, which had to be rewired and was cut over in February 1987.

Concurrent with switch installation, microwave paths were being licensed with the Federal Communications Commission; under-street right-of-way was being acquired from the city of Dallas; space was leased at the top of Interfirst Plaza for microwave radios, antennas and DACS; and fiber-optic cable was being laid. The office support hardware and software were installed in October 1986, and training classes began.

The ISN network was installed and operational at each location by March 1987. In April, the microwave equipment was cut over — it had been delayed three months due to late equipment delivery — and the entire network became operational.

In addition to the educational network's uniqueness as a software-defined digital network using DACS switching, there are a few other significant aspects to this network. Four-digit dialing between the district's nine locations is made possible by the Common Channel Interoffice Signaling hardware and software in the NEC 2400 switches.

The system uses 56K bit/sec data modules with the NEC switches to route data from the multiplexers and ISN nodes through the switches to interface with the microwave system.

Finally, the NEC switches, DACS and ISN nodes are controlled by microcomputers at the District Service Center. This allows centralized network control for troubleshooting, traffic analysis and adjustment for changing conditions.

Present performance

The network has been performing extremely well since cutover and appears to be rock solid. There are more than 2,000 telephones, of which 550 are new digital instruments with many advanced features; 620 microcomputers serving as multifunction office support workstations; 650 administrative and educational terminals; and digitally compressed video instruction between the District Service Center and Cedar Valley campus, all using the integrated digital network.

The ISN wide-area network currently supports the microcomputers on the office support network, but all data processing terminals will be added to the net in the next six months.

ITFS licenses for an analog video network have been acquired and a three-channel system will be installed by May 1988. This separate network will permit video instruction between all campuses, as well as to local business and industry. Teleconferences and any other video production can be downlinked from satellite and piped over the ITFS channels to any location.

The economic benefit anticipated by the strategic plan looks firm. More than $2 million will be saved over the net's eight-year life just on present levels of use. But considering that the projected growth will also be handled more economically, even greater savings will be realized.

Secrets of their success

The key ingredients to the success of the project were:

- A well-represented district planning committee that worked together to assess needs and develop objectives.
- Hiring a competent consultant that designed, specified and coordinated a complex system.
- Selecting a general contractor that had the expertise, track record and local commitment to install and implement, on schedule, a unique private communications network.

The DCCCD is proud of the result and convinced that its strategic plan has become reality. The district will be able to contain future costs stemming from inflation and growth, and it has greatly expanded network capabilities and capacity.

The Nodal Processor For Dynamic T-1 Networks

You know your T-1 network is going to change. The problem is, you're just not sure how or when. Datatel has the solution—the DCP9900, a T-1 Nodal Processor that's designed for changes—the ones you plan and the ones you don't.

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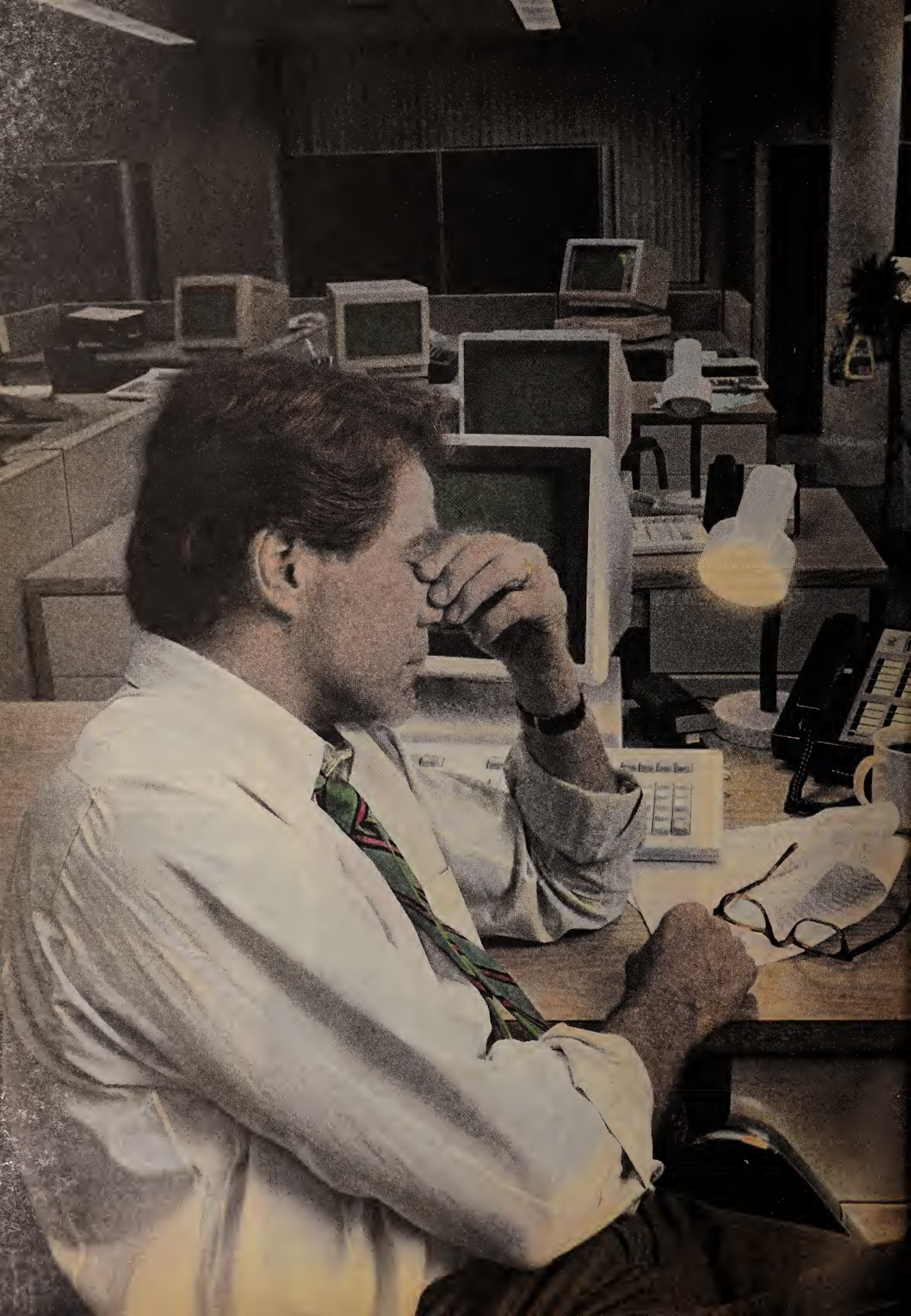
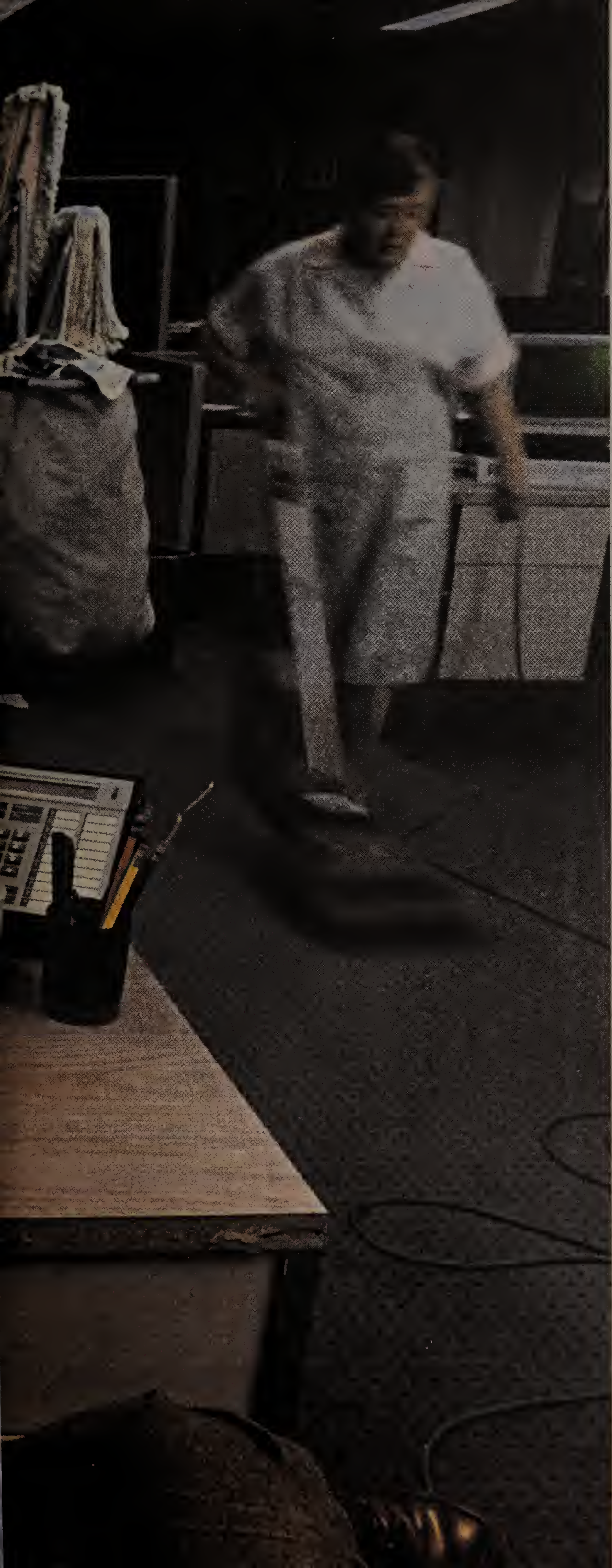
If a T-1 link goes down or a site loses power, you'll barely even notice. If a link fails, the DCP9900 simply reroutes traffic, dynamically assigning bandwidth on the remaining links in accordance with user-set priorities. It can even switch voice channels from PCM (64 Kbps) to ADPCM (32 Kbps), if necessary, to conserve bandwidth for higher priority data channels. Network control is performed by intelligence distributed among the DCP9900 nodes so if a site loses power, traffic is automatically rerouted over alternate paths.

For more information on the powerful DCP9900, call toll free, 1-800-424-4451 (in New Jersey, call 1-609-424-4451) or write Datatel, Inc., Cherry Hill Industrial Center, Cherry Hill, NJ 08003. Representatives worldwide.

Datatel

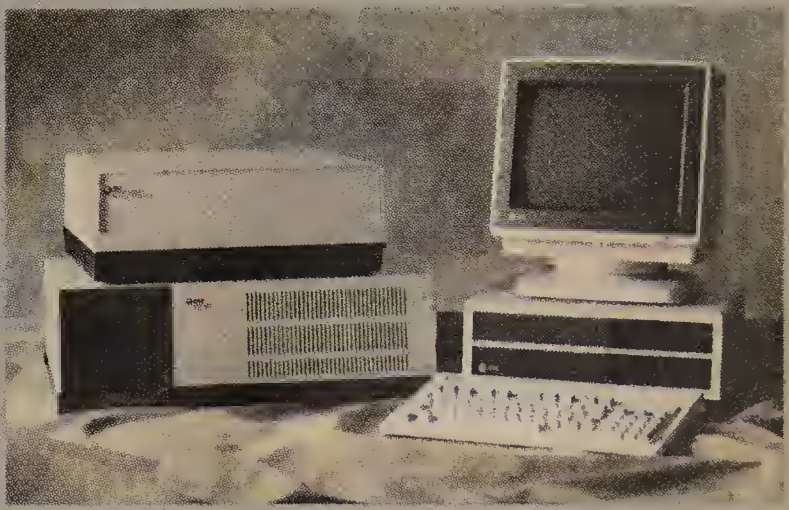




"*It's 6:33 pm. The lines are down. And she's the closest thing I've got to a technician.*

Meanwhile, I've got a sales guy here waiting to close a half-million-dollar deal, and he's screaming 'why didn't my order go through.' I have no clue. My technical staff is home watching the game. And all I keep thinking is whatever happened to that word reliability? If I could have anticipated the problem, at least I would have had a chance. As far as I'm concerned, somebody at headquarters better start talking to AT&T about getting a network management system. Or they can find themselves a new whipping boy.

AT&T comes through."



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Microcomputer communications software

In search of standards

Microcomputer communications software's more powerful and sophisticated, but users still await industry standards.

Continued from page 1

the vertical markets we've surveyed, multivendor connectivity and compatibility, more seamless connectivity and the ability to access any information through a common interface is what they want," says Nancy Kirk, director of industry research for the Vertical Market Program at The Sierra Group, a Tempe, Ariz., consulting firm.

Although today's software doesn't completely satisfy those demands, more people are turning to personal computers to solve everyday problems, because they're a more productive way of doing business. With the right software, they fetch business reports, check airline reservations, communicate with bulletin board services (BBS), receive and print newsletters, and poll sales offices around the world at night. And since no special modems are needed, additional hardware investments are unnecessary.

Seamless connectivity

Software products designed for specific niche applications come closest to meeting the seamless connectivity goal. Electronic mail, the largest and fastest growing segment of this market, is a good example. Productivity gains with E-mail are almost guaranteed, and users are clamoring to be part of the action.

"Of the seven million messages Western Union [Corp.] processes each month, 30% to 40% are destined for another computer. There's a tremendous productivity gain from using electronic mail. Imagine having the ability to send a Lotus [Development Corp.] spreadsheet file with all formatting included," says Richard Pekelney, vice-president of research and development for Kensington Microware, Ltd.

Bruce Walton, consultant for Productivity Performance, Inc. based in Newport Beach, Calif., also sees E-mail growing rapidly, because "the X.400 format protocol [which will allow uniform mail services] will be a big plus and will mean a lot more electronic mail usage."

Vendors are also making it easier for users to access E-mail services by preprogramming access routines. Instant Mail Manager from Kensington Microware, MiMail from Micro-Integration Corp., Desktop Express from Dow Jones Software, Lotus' Lotus Express and Connex from Productivity Performance are among the packages that allow users to access E-mail with a single keystroke.

E-mail is also being used to extend publishing facilities to organizations lacking identical software. The ability to transmit both text and images, even when the receiving terminal does not have duplicate communications software, is a recent advance being termed "desktop telepublishing." Microphone II from Software Ventures Corp., Desktop Express and Lotus Express are representative of this new genre.

Youth News Service (YNS), a Washington, D.C. nonprofit organization that encourages students to submit news stories to an on-line mailbox service, takes advantage of this technology. "By marrying a Macintosh personal computer with Desktop Express software and [MCI Communications Corp.] MCI Mail, YNS now has communications power similar to that of any elaborate news service that employs a communications network," says Tom Engleman, director of The Dow Jones Newspaper Fund, Inc., a YNS sponsor. When the system is used to create YNS' newsletter, the re-

Continued on page 55

Stemmler is an associate consultant at TMS Corp., a telecommunications consulting firm in Devon, Pa.

Microcomputer communications software

Vendor/Product	Personal computer requirement	Minimum random-access memory	Operating system	Transmission speed (bit/sec)	Terminal emulation	Error correction	Security	Features	Site license	Price
Apple Computer, Inc. Cupertino, Calif. Macterminal, Version 2.2	Apple Macintosh II, SE, Plus, 512KE, 512K and Macintosh 128	128K	Macintosh Finder	50 to 19.2K	Digital Equipment Corp. VT52/100; IBM 3278; and ANSI	XModem		Preset logons for most BBS and time-sharing services; save entire session; scroll-back; print area highlighted with mouse; tab ruler	No	$125
ButtonWare, Inc. Bellevue, Wash. PC-Dial, Version 2.0	IBM Personal Computer, XT, AT and Personal System/2	256K	PC-DOS/MS-DOS 2.0 or higher	75 to 9.6K	ANSI	XModem and XModem CRC		Text editor: 12 macro and script; script language; menu- and command-driven; toggle to DOS; user-defined scripts; print incoming data directly to printer	Yes	$59.95
Century Software Salt Lake City Term Communications Software, Version 6.0	Most personal computers	512K	MS-DOS, Xenix, Unix, VMS and some CP/M	150 to 38.4K	DEC VT52/100, 102; Televideo Systems, Inc. TV 912, 924, 925; Wyse Technology, Inc. 50, 60; and ANSI	XModem, Kermit, Term CRC	Dial-back, passwords, permission settings	Concurrent multiple modem support; script language; data compression; remote personal computer operation; worldwide Telex interface	Yes	$195 to $1,295, depending on computer system
Coefficient Systems Corp. New York VTerm III, Version 1.41	IBM Personal Computer, XT, AT and Personal System/2	256K	PC-DOS/MS-DOS 2.0 and higher	50 to 19.2K	DEC VT52/100, 220, Tektronix, Inc. 4010	Kermit, XModem, VTrans, ASCII 2	Data compression on file-transfer programs	Menu-driven; full multinational character set; soft-key scripts; reformats data into data bases and spreadsheets; keyboard and screen emulation; 11 national character sets; supports enhanced and standard keyboards; co-residency with such software packages as Borland International, Inc.'s SideKick and SuperKey, and Rosesoft, Inc.'s ProKey	Yes	$245
Communications Research Group Baton Rouge, La. BLAST II, Release 8.1	Most personal computers	Varies	PC-DOS/MS-DOS, Macintosh, Unix, Xenix	300 to 38.4K	DEC VT52/100, 220; Data General Corp. D200; Hewlett-Packard Co. HP 2398; and others	Xmodem, BLAST II	Multilevel passwords, protected algorithm	Text editor; script language; menu-driven and bypass; same scripts run on personal computers, Macintoshes, Unix and VAX; checkpoint restart	Yes	$250, personal computer; $195, Macintosh; $395, Xenix; $395 and up, Unix
Crosstalk Communications/DCA Roswell, Ga. Crosstalk Mk. 4, Version 1.01	IBM Personal Computer, XT, AT and Personal System/2	256K	PC-DOS/MS-DOS 2.0 and higher	300 to 115.5K	AT&T 510/513; Applied Digital Data Systems, Inc. (ADDS) Viewpoint; DG Dasher 200 series; Datapoint Corp., DEC VT52 /100, 101, 102, 220; Esprit Systems, Inc. III; IBM 3101; Zentec Corp. ADM-3A; Televideo TV 912, 920, 925, 950; IBM 525X, 529X, 3278; and ANSI	XModem, YModem, X.PC, Kermit, Crosstalk and Real Decisions Corp.'s DART	Multilevel password	Menu-driven; text editor; phone directories; unlimited macros; script language; up to 15 simultaneous, toggable sessions; data compression; 8K-byte review buffer	No	$245
Datastorm Technologies, Inc. Columbia, Mo. ProComm, Version 2.4.2	IBM Personal Computer, XT, AT and Personal System/2	128K	PC-DOS/MS-DOS 2.0 or higher	300 to 19.2K	DEC VT52/100, 102, IBM 3101; Televideo TV912, 920, 925, 950; ADDS Viewpoint; Wyse 100; Zentec ADM3/5; Heath/Zenith Data Systems 19; and ANSI	XModem, YModem, Kermit, CompuServe B, Telink, Modem 7, Windowed XModem	Two-level password in unattended-host mode	Menu- and command-driven; script language	Yes	$50
Dow Jones Software Princeton, N.J. Desktop Express, Version 1.0	Macintosh 512K, Plus, II, SE	512K	Macintosh 3.2 and above	300 to 2.4K	NA	X.PC	Protected passwords	Command- and menu-driven; text editor, image file transfer; electronic-mail plus hard copy print; address book, file transfers and compatibility with Lotus Development Corp.'s Lotus Express; exchanges Microsoft Corp.'s Excel file and Lotus 1-2-3	Yes	$149
Hayes Microcomputer Products, Inc. Atlanta Smartcom III, Version 1.0	IBM Personal Computer, XT, AT and Personal System/2	512K	PC-DOS/MS-DOS 2.0 to 3.3	300 to 38.4K	DEC VT52/100, 102; and ANSI	XModem, XModem CRC, XModem 1K, YModem, YModem G, Kermit	Password; data encryption	Keyboard macros; script language; menu-driven with bypass; text editor; variable-size capture buffer; two concurrent communications sessions	No	$249
Headlands Communications Corp. Tiburon, Calif. PC-Talk 4, Version 1.39F	IBM Personal Computer, XT, AT, and Personal System/2	256K	PC-DOS/MS-DOS	30 to 9.6K	DEC VT52/100; plus 48 others	XModem, XModem CRC		Menu-driven; 40 macro keys; one-line editor; DOS accessible from program	No	$99
Hilgraeve, Inc. Monroe, Mich. HyperAccess, Version 3.25	IBM Personal Computer, XT, AT and Personal System/2	192K	PC-DOS/MS-DOS 2.0 and higher	300 to 57.6K	DEC VT 52/100, 220; TelevideoTV925/ 950; IBM 3101, 3278; Honeywell, Inc. 19; Wang Laboratories, Inc. VS2110; and ANSI	XModem, Checksum CRC, Kermit, ASCII, Hyper-Protocol	Passwords	Menu-driven; script language; macro keys; data compression at five times the modem rate; remote dial and remote answer; compatible with multitasking programs; dial- and loop-back for simultaneous sessions	No	$149
Houston Computer Services, Inc. Houston Octacomm PC, Version 2.53	Texas Instruments, Inc. TIPC, TI Business Professional; IBM Personal Computer, XT, AT and Personal System/2	128K	TI DX10 or DNOS; IBM PC-DOS/MS-DOS 2.0 and higher	300 to 19.2K	DEC VT52/100, 102; Televideo TV924/950; TI TI931/940	ARQ		Menu-driven; text editor; full screen and keyboard emulation, business graphics; built-in DIR and SHOW commands; data communications 1/ data communications 3 flow control (2,560K-byte buffer); block-oriented protocol (character mode) with data-integrity checking	Negotiable	$125
Kensington Microware, Ltd. New York Instant Mail Manager X.PC, Version 1.32	IBM Personal Computer, XT, AT and Personal System/2	384K	PC-DOS/MS-DOS 2.0 and higher	110 to 9.6K	DEC VT100	X.PC, XModem	Passwords	Menu-driven; word processing, address list; automatic send and receive; unattended, queued-message transmission; multiple-message transmission (binary and text); electronic data interchange message support; send and receive E-mail from DOS command line; preset and custom-programmed logons	Yes	$150

API = Application program interface
ARQ = Automatic repeat request
BBS = Bulletin board services
The Source = On-line news service offered by McGraw-Hill, Inc.
Dow Jones News/Retrieval Service = On-line news service offered by Dow Jones Information Service Group

CRC = Cyclic redundancy check
LRC = Longitudinal redundancy check
NA = Information not available
XFR = Polygon's File Transfer

Chart continued on page 54

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integrates all the features of an intelligent T1 multiplexer with the appropriate network management system to meet your needs. Now DSC Granger announces a new family of Network Management products. No one can offer a wider range of tailored alternatives to your T1 requirements.

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Features	Linked Intelligence Monitor	Linked Intelligence Controller	Linked Intelligence Control Center
User Interface	ASCII Terminal	P.C.	Graphics Work Station
Automatic Route Restoration	Operator-directed	Operator-directed	Automatic Optimum Route Restoral
Best Route Optimization	Operator-selected	Operator-selected	Automatic
Dial Back-up	Yes	Yes	Yes
Automatic Alarm Reporting	Yes/Netview P.C. Support*	Yes/Netview P.C. Support*	Yes/Netview P.C. Support*
Reports/Alarms	Pre-defined	User-defined	User-defined
Diagnostics	Command-oriented: —local —remote	Menu-driven: —local —remote —system	Menu-driven: —local —remote —system —circuit
Levels of Security	5	User-definable	User-definable
Partitioned Networks	Physical	Software-definable	Software-definable
Network Synchronization	Pre-programmed	Pre-programmed	Dynamic

Network Management

The Digital Network Access System offers much more than simply telling you the status of the network. Our full management system includes an open architecture that exchanges key performance information over multiple logical networks. Add management features as you reach your next networking milestone.

Our Unique Advantage –

Only DSC Granger products let you begin your T1 network for as little as $10,000 a node. Sophisticated features, such as automatic route restoration, customized reports and Netview P.C.,* can be added as required.

Linked Intelligence™

Linked Intelligence allows for the best of two worlds: distributed bandwidth management throughout the network, without excessive overhead or loss of DS0 channelization. Now your communications needs can be met without sacrificing network control for true network compatibility.

This system comes in three network management configurations. Each level works with the CP2000 to maximize its effectiveness in a different communications environment.

Cost Efficiency

Control your costs by only expanding the network as your business expands. Begin at the point of maximum effectiveness and add only when necessary. The Digital Network Access System was designed to supply T1 growth logically and cost-effectively down the road.

Support All the Way Down the Road

The Digital Network Access System is supported, nationwide, by the DSC Granger subsidiary of DSC Communications Corporation. This means a long-term commitment to the future growth and capability of your T1 network.

Only DSC Granger Puts You in the Driver's Seat

Before you finalize your T1 plans, call or write DSC Granger today and ask for your FREE "Road Map to T1." It may just help you avoid some of those accidents and delays along the way.

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*Netview PC is a registered trademark of International Business Machines Corporation.

Microcomputer communications software (continued)

Vendor/Product	Personal computer requirement	Minimum random-access memory	Operating system	Transmission speed (bit/sec)	Terminal emulation	Error correction	Security	Features	Site license	Price
Kortek, Inc. **Palo Alto, Calif.** **Freeway Advanced, Version 2.2**	IBM Personal Computer, XT, AT, 386s, Personal System/2	312K	PC-DOS/MS-DOS 2.1 and higher	75 to 115.2K	DEC VT52/100; Freeway	ASCII, Kermit, XModem, XModem CRC, YModem, YModem Batch, CompuServe B, Freeway and Freeway File Server	Password protection in on-line phone book	Menu-driven and hot-key; script language; supports ANSI graphics; unattended auto-answer; 8K-byte review buffer; status line-autodetect modem speed at connect line; four communications ports; auto-pilot and key-stroke memory; page editor with word wrap and snake; accepts Crosstalk-16 scripts; nine phone books	Yes	$139
LaSalle Microcomputer, Inc. **Buffalo Grove, Ill.** **BackComm, Version 1.3**	IBM Personal Computer, XT, AT and Personal System/2	256K	PC-DOS 2.1 and PC-DOS/MS-DOS 3.0 series	50 to 19.2K	DEC VT52/100; Zentec ADM-3A; Televideo TV925; ADDS Viewpoint terminals; Ampex Corp. 210; Heath/Zenith H19; ANSI	XModem, XModem CRC and X.PC	Two-level program password, data encryption, customized activity log	Text editor; script language and files; menu-, command- and mnemonic-driven; six-level telephone directory and search; autocaller and autorepeat; cost of call tables; concurrent background and foreground communications; 10 fully editable, variable-size capture buffers; modem customization files; disk file utilities; character filters	Yes	$149
Lattice, Inc. **Lombard, Ill.** **SideTalk, Version 1.00**	IBM Personal Computer, XT, AT or compatible	128K	PC-DOS/MS-DOS 2.0 or higher	300 to 9.6K	ANSI	XModem, YModem, YModem Batch, XModem CRC, ASCII	Password within SideTalk Command Language to open and read files	Menu- or command-driven; SideTalk Command Language script; background communications and receive alarm; foreground and background communications; background controlled from foreground; simultaneous sessions on multiple communications ports	Yes	$119
Lindbergh Systems, Inc. **Ann Arbor, Mich.** **Omniterm 2, Version 5.10**	IBM Personal Computer, XT, AT and Personal System/2	128K	PC-DOS/MS-DOS 2.0 or higher	50 to 19.2K	DEC VT52/100	XModem, Checksum	Unattended-host mode and password protection	Menu-driven; user-definable macros without conditionals; character translation tables with 256 codes for each I/O device; single-line editor; on-line scroll-back	Yes	$129.95
Lotus Development Corp. **Cambridge, Mass.** **Lotus Express, Version 1.0**	IBM Personal Computer, XT, AT and Personal System/2	256K with PC-DOS/MS-DOS 2.0, 320K with PC-DOS/MS-DOS 3.0 and higher	PC-DOS/MS-DOS 2.0; PC-DOS/MS-DOS 3.0 and higher	300 to 9.6K	ANSI	X.PC	Password for MCI's MCI Mail	Menu-driven; text editor; background operation and automatic background polling; binary file transfer	No	$150
Meridian Technology, Inc. **Irvine, Calif.** **Carbon Copy Plus, Version 4.0**	IBM Personal Computer, XT, AT and Personal System/2	256K	MS-DOS 3.0 and higher	1.2K to 19.2K	DEC VT52/100; Televideo TV920; IBM 3101	XModem, Kermit, CC-DOS	Multilevel password, dial-back, data encryption, audit trail and log	Script language; menu- and command-driven; 40 user-definable macro keys; foreground and background communications; data compression; interactive graphics; Crosstalk-16-compatible	No	$195
Micro-Integration Corp. **Newmarket, N.H.** **MiMail, Version 2.0**	IBM Personal Computer, XT, AT and Personal System/2	128K	PC-DOS/MS-DOS 3.0 and higher	50 to 19.2K		Kermit	Logon password; E-mail encrypted under two passwords	Text editor; light bar menus or function keys; data compression; background and multitasking file transfers; broadcast E-mail	Yes	$89.95
MicroPlot Systems **Westerville, Ohio** **PC Plot-IV Plus, 4.XX**	IBM Personal Computer, XT, AT and Personal System/2	256K	PC-DOS/MS-DOS 2.0 or higher	2.4K to 9.6K	Tektronix, Inc. 4010, 4014, 4027, 4105; DEC VT100/200	XModem, Kermit		Menu-driven; script language; programmable function keys; autodial phone directory; multiple on-line setups; screen dump to laser-jet and dot-matrix printers; programmable XModem parameters; background communications; foreground and background color keyboard mapping	No	$225
Microsoft Corp. **Redmond, Wash.** **Access, Version 1.02**	IBM Personal Computer, XT, AT, Jr. and Personal System/2	256K	DOS 2.0 or higher	300 to 9.6K	DEC VT52/100	X.PC, XModem	Password, data encryption	Text editor; script language; predefined scripts for time-sharing services; menu- and command-driven; mail editor/program; phone book; record mode and macro recall	No	$250
Persoft, Inc. **Madison, Wis.** **SmarTerm 240, Version 2.0**	IBM Personal Computer, XT, AT and Personal System/2	512K	PC-DOS/MS-DOS 2.0 to 3.2	300 to 19.2K	DEC VT52/100, 102, 220, VT241/240; Tektronix 4014	XModem, Kermit		Menu-driven; 20 soft keys/macros; DEC VT241 graphics emulation	Yes	$345
Pinpoint Publishing **Emeryville, Calif.** **Point To Point, Version 2.0**	Apple Macintosh IIE, IIC and IIGS	128K	Pinpoint's ProDOS	300 to 2.4K (modem) to 9.6K (direct connect)	NA	Extended XModem		Full-screen text editor; menu-driven; autodial for preset autotransmit; branching conditional macros; uses Applework File Card user interfaces; binary II transfer; visible mnemonic commands	Yes	$129
Polygon, Inc. **St. Louis, Mo.** **Poly-STAR/240, Version 1.1**	IBM Personal Computer, XT, AT and Personal System/2	512K	PC-DOS/MS-DOS 2.0 or higher	50 to 19.2K	DEC VT52/102, 220; VT125, 240, 241	XFR		Menu- and command-driven; script language; macros; foreground file transfer; up to 20 simultaneous sessions; 132-column support; adjustable screen saver; international keyboard mapping; graphics support	Yes	$299
Productivity Performance, Inc. **Newport Beach, Calif.** **Connex, Version 1.1**	IBM Personal Computer, XT, AT and Personal System/2	256K	PC-DOS/MS-DOS 2.0 or higher	300 to 9.6K	Any ASCII	Echo-Check, XModem	Two-level passwords; log transmissions and codes	Menu-driven; mail send and receive; preprogrammed call commands for on-line data bases, all subservices and custom installs; binary transfers; foreground and background communications; full word processor and editor; reads all other word processors; Boolean-method searches	No	$195.95

API = Application program interface
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XFR = Polygon's File Transfer
The source = On-line news service offered by McGraw-Hill, Inc.
Dow Jones News/Retrieval Service = On-line news service offered by Dow Jones Information Service Group

Microcomputer communications software (continued)

Vendor/Product	Personal computer requirement	Minimum random-access memory	Operating system	Transmission speed (bit/sec)	Terminal emulation	Error correction	Security	Features	Site license	Price
R&S Micro Services **Minneapolis** **TeleWriter II, Version 1.2**	IBM Personal Computer, XT, AT and Personal System/2	192K	PC-DOS/MS-DOS 2.0 or higher	110 to 9.6K	DEC VT52/100	XModem	Password data encryption (built-in)	Text editor and full-featured word processing; command- and menu-driven; keyboard macros; prewritten scripts for CompuServe, The Source and MCI Mail background printing; on-line editing of files downloaded into RAM	No	$129
Simware, Inc. **Ottawa** **SIMPC Master, Version 4.1**	IBM Personal Computer, XT, AT and Personal System/2	384K	PC-DOS/MS-DOS 2.0 or higher	300 to 9.6K	DEC VT100; IBM 3270	XModem, Kermit, CRC and LRC	Encrypts user identifications and passwords	Command- or menu-driven; script language; data compression; operates under VTAM/VM; background file transfer; supports asynchronous, X.25, synchronous, coaxial, hardware protocol converters and local-area networks; file filters; API; requires Irma-like protocol-conversion hardware	Yes	$325, single copy; $21,000, multiple copy (up to 250 copies)
SoftKlone Distributing Corp. **Tallahassee, Fla.** **Mirror II, Version 3.6.12**	IBM Personal Computer, XT, AT and Personal System/2	256K	PC-DOS/MS-DOS 2.0 and higher	75 to 115.2K	DEC VT52/100; IBM 3101; Televideo TV912, 920, 925; Zentec ADM-3A; ADDS Viewpoint; DG D210; ANSI; TI TI940; Honeywell VIP7200	XModem Batch, CRC, YModem, Crosstalk-16, Hayes Microcomputer Products, Inc. Verification, Kermit	Multilevel individualized passwords	Text editor and full-function word processing; command-driven; 40 macro keys; script language; 16 add-on modules to customize terminal emulation; data compression; extended script filing	Yes	$69.95
Softronics, Inc. **Colorado Springs** **Softerm PC, Version 2.10.01**	IBM Personal Computer, XT, AT and Personal System/2; Wang Laboratories Wang PC; TI Professional; HP portable; NEC Corp. APC3; Zenith Data Systems Z100; Tandy Corp. 1000, 2000	256K	PC-DOS/MS-DOS 2.0 or higher	50 to 115.2K	50 full emulations including: DEC VT52/100, 102, 220; DG D200, 410; HP2622, 2392; Televideo TV910, 921, 925, 950, 955; and IBM 3101	XModem, XModem CRC, Kermit, Kermit server, Crosstalk (C-link), Hayes Verification and Softrans	Local and remote password	Text editor; script language; learn mode; macros; background mode; four simultaneous emulations; four communications ports; seamless remote virtual disk; background mail monitor with hot key; customized keyboard mapping; Network Basic I/O System support	Yes	$195
Software Ventures Corp. **Berkeley, Calif.** **MicroPhone II, Version 2.0**	Apple Macintosh 512, Plus, SE and II	512K	Macintosh Multifinder and compatibles	50 to 57.6K	DEC VT52/100	XModem, 1K XModem, Apple MacBinary, YModem, YModem G, Apple MacTerminal 1.1	User-protected passwords; on-line scripts	Desk accessory via text editor; menu- and icon/mouse-driven; macro-script language; mouse-controlled script window; concurrent background and foreground processing; desktop telepublishing; customized modem files	No	$149
The Freesoft Co. **Beaver Falls, Pa.** **Red. Ryder, Version 10.3**	Macintosh 512K, 512 Ent, Plus, SE, II, XL and 512E	512K	Macintosh Finder, Multifinder	300 to 57.6K	DEC VT52/100	XModem, YModem Batch, 1K Modem, 1K YModem Batch, Kermit, CompuServe B	Password protection in on-line phone book	Graphics transfer; menu-driven; 30 user-definable menus and macros; 150-command procedure languages; built-in two-pass compiler; movable and resizable windows; background mode; phone books with unlimited entries	No	$80
Transend Corp. **Portola Valley, Calif.** **PC COMplete, Version 4.0**	IBM Personal Computer, XT, AT and Personal System/2	384K	PC-DOS/MS-DOS 2.0 or higher	300 to 19.2K	DEC VT52/100	XModem, Kermit	Two-level password; data encryption	Text editor; graphic interface; macro language; learn mode; desktop metaphors with icons; background mode in Deskview and Windows environment; E-mail autosend and receive; on-line capture buffer; user-defined modem drivers	Negotiable	$229
Triton Technologies, Inc. **Red Bank, N.J.** **CO/Session**	IBM Personal Computer, XT, AT and Personal System/2	128K	PC-DOS/MS-DOS 2.1 and higher	300 to 38.4K	ASCII teletypewriter terminal	Proprietary CRC, XModem	Call and logon IDs, dial-back, directory limitations, encryption	Remote personal computer control, concurrent foreground and background, remote access and printing, session recording of displayed data, automatic billing log, color support, telephone directory searches	No	$249 (two-user license)
VM Personal Computing, Inc. **Danbury, Conn.** **Relay Gold, Version 2.0**	IBM Personal Computer, XT, AT and Personal System/2; Wang Laboratories Wang PC	19.2K	MS-DOS 2.0 and higher	110 to 19.2K	DEC VT52/100; IBM 3101/3278	Relay Protocol, Kermit, XModem, CRC, Checksum	File encryption, dial-back, multilevel program passwords in unattended mode	Text editor; script language; auto-script writing; menu- or command-driven; macros; background communications; custom menus; API; 32-screen scroll-back; program enhancements downloaded from BBS; NETBIOS-compatible	No	$250

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Dow Jones News/Retrieval Service = On-line news service offered by Dow Jones Information Service Group

SOURCE: TMS CORP., DEVON, PA

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sult is a "professional product that looks typeset, with headlines, italics and fonts," he says.

Traditional uses enhanced

Traditional applications, such as file transfers and multiple-session support, have also received a shot in the arm through enhanced facilities. In addition, many vendors are seeking to make communications more user-friendly by emulating terminals and obviating the need for users to write script routines.

Softronics, Inc.'s Softerm PC is one such system. It incorporates terminal emulation, communications and file-transfer facilities. There is no need to write script routines because the package comes preconfigured to operate in different host environments.

For users who would rather write their own communications interfaces, just about all of the packages listed in the accompanying chart provide a proprietary script language. Script language is a programming language that gives technically oriented users the ability to write complex routines in order to simplify certain communications operations.

The level of sophistication and power in script languages varies. Some have a minimal number of commands, while others are highly structured, with several hundred commands.

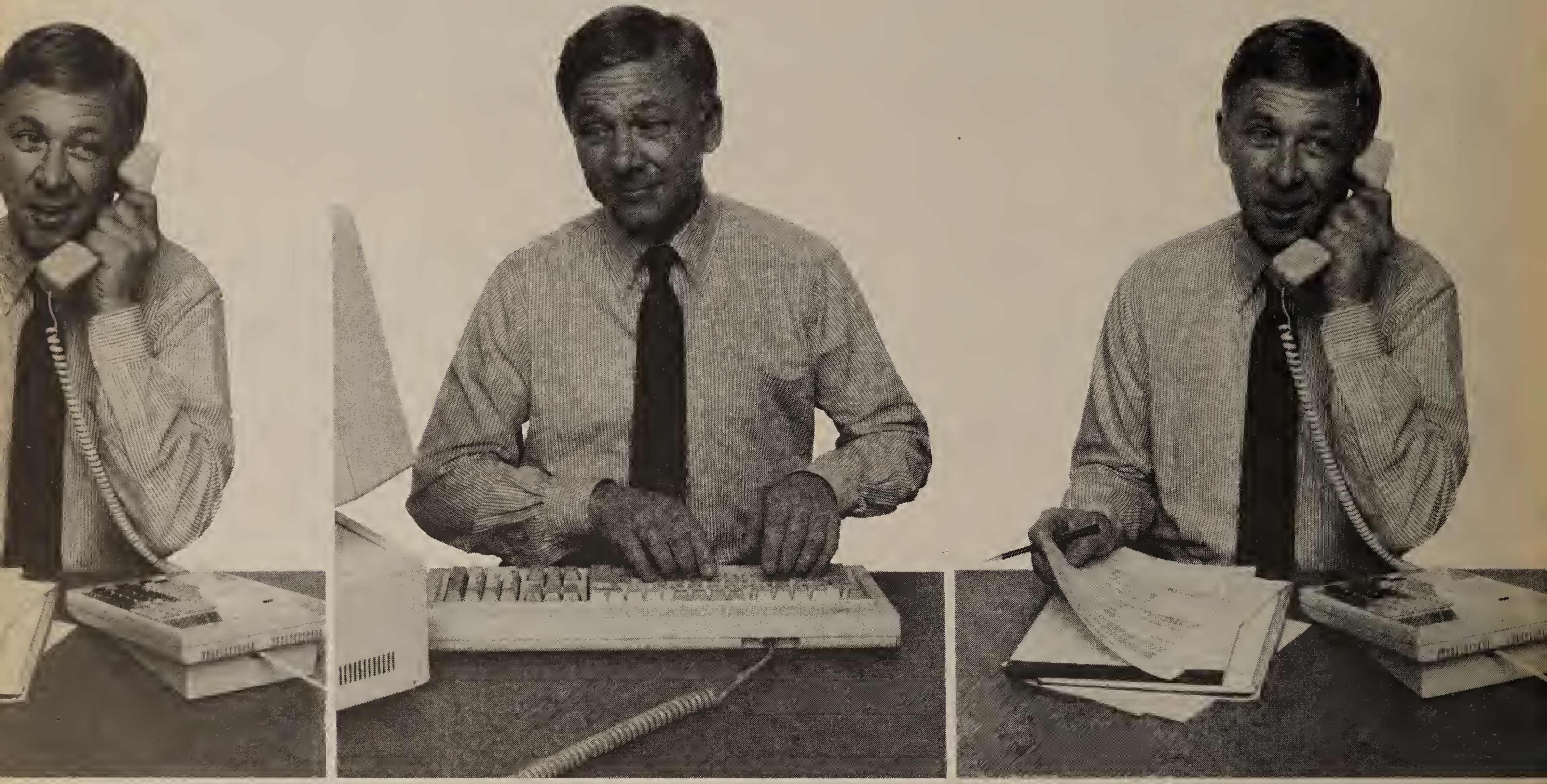
Some of the biggest improvements in microcomputer communications software have been in the area of multisession support. Many new packages permit applications to run concurrently in the foreground and background partitions and let users hot-key between sessions as well as toggle from an application into DOS and return to the same point in the application.

LaSalle Microcomputer, Inc.'s BackComm, Meridian Technology, Inc.'s Carbon Copy, Microphone II, The Freesoft Co.'s Red.Ryder, VM Personal Computing, Inc.'s Relay Gold, Lattice, Inc.'s SideTalk and Softerm PC offer such facilities.

Several packages also let users run several applications simultaneously and hot-key between them. For example, Crosstalk Communications/DCA's Crosstalk Mk.4 permits up to 15 simultaneous sessions, and Polygon, Inc.'s PolySTAR/240 allows up to 20.

Continued on page 58

The new IBM 9750 Business Communications System.



For everybody who wants more flexible computer networks, IBM has an answer: more flexible *telephone* networks. Even better, we've made them a reality.

Introducing the IBM 9750 Business Communications System and its centerpiece, the new IBM 9751 CBX.

Developed by ROLM, they give you powerful digital voice switching capability, plus data connectivity for virtually any desk that has a phone on it.

Unlike other telephone switches (or PBXs), the IBM 9751 CBX comes with nearly every line "data-ready." So when you hook up your phones, you get computer connectivity in the bargain.

That way, you no longer have to decide in advance exactly how every single workstation ought to be networked. You have the flexibility to connect occasional (or unexpected) users, easily and economically. With an IBM 9750 fully installed, you can open your data resources to more people who need them, without spending to equip areas that may never need them.

Even if you use it for voice only, the IBM 9751 CBX will keep you years ahead. It's one of the most expandable systems in the industry, able to serve from 100 to 20,000 lines. So as you

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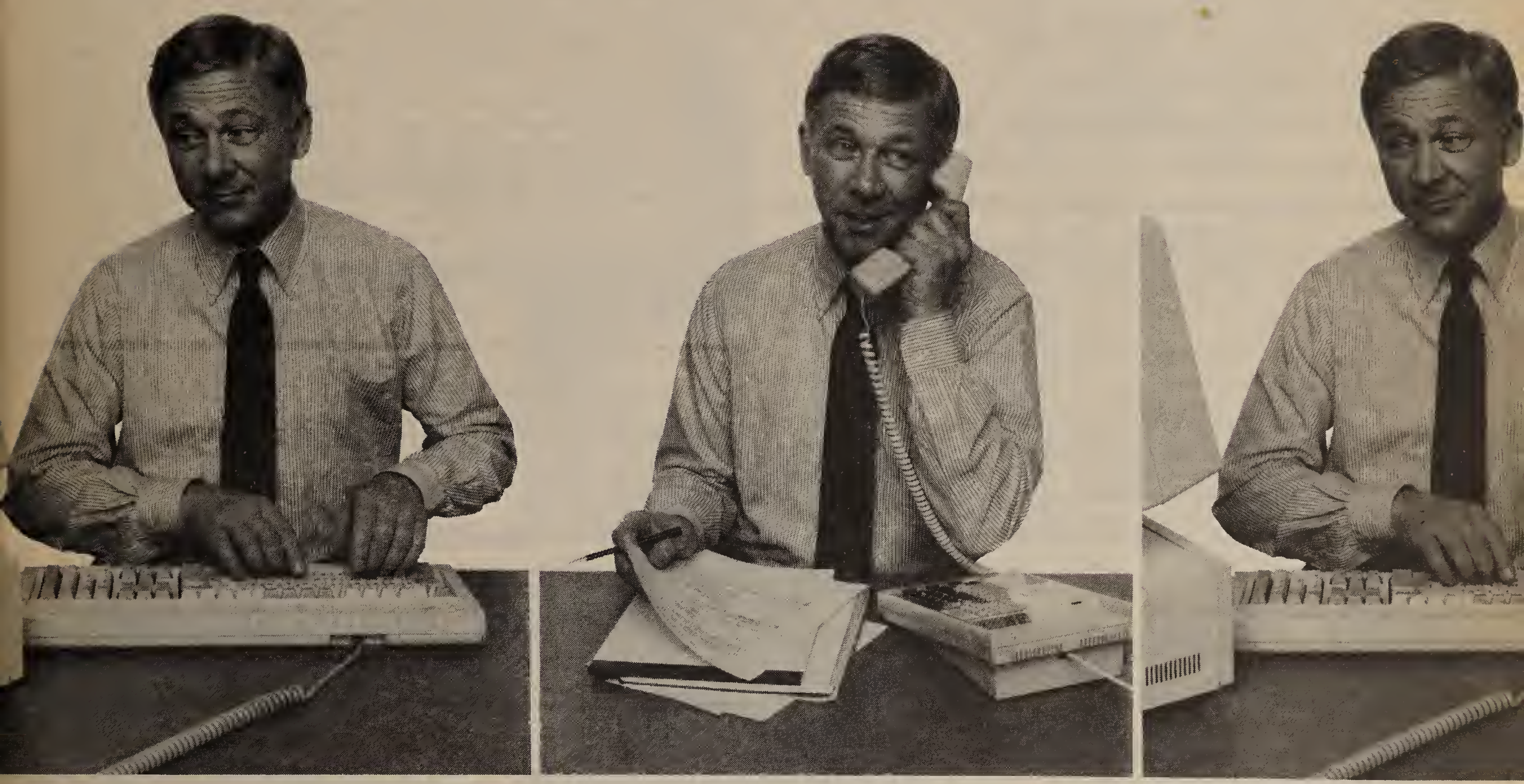
Any connection between voice and data is purely intentional.



grow, it grows. Yet it's much smaller than its predecessor, the ROLM CBX II, and it's easier on power and air conditioning.

On the other hand, its traffic-carrying capacity is tremendous. The 9751 can be configured so it's virtually impossible to block.

And its 9000AE (for Advanced Engine) processor not only gives you every digital advantage (like ROLM PhoneMail® and Least Cost Routing), it has reserve power to handle these applications under heavy use and to let you add new applications as you need them.

When ISDN standards are established, the IBM 9751 will be able to work with them. It was built with ISDN in mind, to provide both the power and bandwidth that ISDN usage (for voice, data and image) will demand.

In fact, the 9750 Business Communications System is a key part of IBM's telecommunications future. Combined with all of IBM's other ways to connect systems, it gives you new freedom to run things your way, to broaden the usefulness of your networks, and to control their expense. To learn more, call your IBM ROLM Systems representative or Authorized ROLM Distributor. IBM®

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One user who finds simultaneous sessions both a time-saver and productivity aid is Dave Azzarito, a consultant for Technology Consultants in Palm Beach, Fla. Azzarito uses BackComm three to four hours a day. He says he finds BackComm's automatic script language powerful and easy to use and says its context-sensitive help menu is the best he's seen.

He also lauds the software for its powerful background communications capabilities. "When you do a lot of telecommunications, you quickly find out that [data transfer] doesn't run as fast as you'd like it to. But, when you have a hot-key back into DOS, you can get something else done. The only thing [BackComm is] missing is windowed protocols."

Data compression during file transfer is another area in which vendors are trying to increase system productivity. Packages like HyperAccess and Term Communications Software provide data compression on the fly.

Data compression during file transfer is another area in which vendors are trying to increase system productivity. Packages like Carbon Copy, Crosstalk Mk.4, Hilgraeve, Inc.'s HyperAccess, Softklone Distributing Corp.'s Mirror II, Simware, Inc.'s SIMPC Master and Century Software's Term Communications Software do standard data compression, and HyperAccess and Term Communications Software also provide data compression on the fly.

Some software allows a system to poll other computers after hours to bring in sales orders and send out acknowledgments. As Rich Kimsey, systems manager for Sizzler, Inc. restaurants of Murray, Utah, and one of the first users of Term Communications Software, explains, "With Term running on our Unix host, we collect data at night from the personal computers in our offices [in six states]."

Other vendors are attempting to increase user productivity by incorporating different functions that can be invoked without toggling. TeleWriter II from R&S Micro Services and Connex incorporate a full-featured word processor within the program's text editor so users don't need to toggle in and out of applications or write script programs.

TeleWriter II user Todd Pierce of modem manufacturer CTS Fabri-Tek, Inc. in Eden Prairie, Minn., says, "I get faster and more accurate documents. It cuts my time in half by having the word processing features incorporated with the communications."

Another TeleWriter II customer, Ray Douglas, general manager of the Twin Cities Computer Network in Minneapolis, supports several hundred users on his system. He replaced his Crosstalk and Micropro International Corp.'s WordStar programs with TeleWriter II and says the product saves him time. Because it offers centering, cutting and pasting and does columns, Douglas says it's almost like having WordStar on-line.

Data security

Security features, such as data encryption, dial back, multilevel passwords and audit trails, are appearing more frequently in microcommunications packages in response to the confidentiality required by E-mail applications and phone books.

Security from telephone line noise and interference, plus data integrity during transmissions, is considered de rigueur by many users. As Polly Henderson, a marketing staffer with Communications Research Group, the creators of Blocked Asynchronous Transmission (BLAST), points out, "The financial and scientific communities in particular demand it, because they cannot afford to have transmissions hang up [due to communications-induced errors]."

Security features, such as data encryption, multilevel passwords and audit trails, are appearing more frequently in microcommunications packages in response to the confidentiality required by E-mail applications and phone books.

A BLAST user who did not wish to be identified says he requires a high degree of data integrity when polling an international dealer network for orders every night. "Having error-free communications is very pertinent. I can sleep knowing it's going on and it's clean."

Vendor support

Getting help when something goes wrong is an important feature for communications users. The first level of support is usually at a user's fingertips with an on-line, context-sensitive help key. Term Communications Software goes so far as to provide its complete user manual on line.

The next level of support requires placing a toll call to the vendor's customer support center, although a few vendors have a toll-free number. Since support centers usually are open only during the vendor's working hours, the time frame for getting answers can be quite short when the user and vendor are on different coasts.

Communications Research offers 12 hours of toll-free telephone support, while Kensington Microware provides toll-free support 24 hours a day, seven days a week. MicroPlot Systems' PC Plot-IV Plus includes written support, and VM Personal Computing's Relay Gold also publishes a quarterly newsletter for users.

A third level of support comes from access to a 24-hour BBS. Users dial in and leave messages for the vendor, which monitors the BBS. Other users on the BBS may also respond with help.

Future developments

Taken together, these many enhancements are beginning to address users' current needs, but what does the future hold for microcomputer communications software and the communications environment as a whole?

Says Communications Research's Henderson, "The entire communications environment is changing greatly. With the [Intel Corp. 80386-based personal computers], the dividing line between micros and other systems is beginning to blur. What exactly is microcommunications software? And which way do you go with Macs running DOS?"

Consultant Azzarito said he feels the future is going to be clouded mainly because of IBM's OS/2. "There's going to be a big split in the PC arena — some [will go] with DOS and some with OS/2." Ultimately, OS/2 may bring more power to communications.

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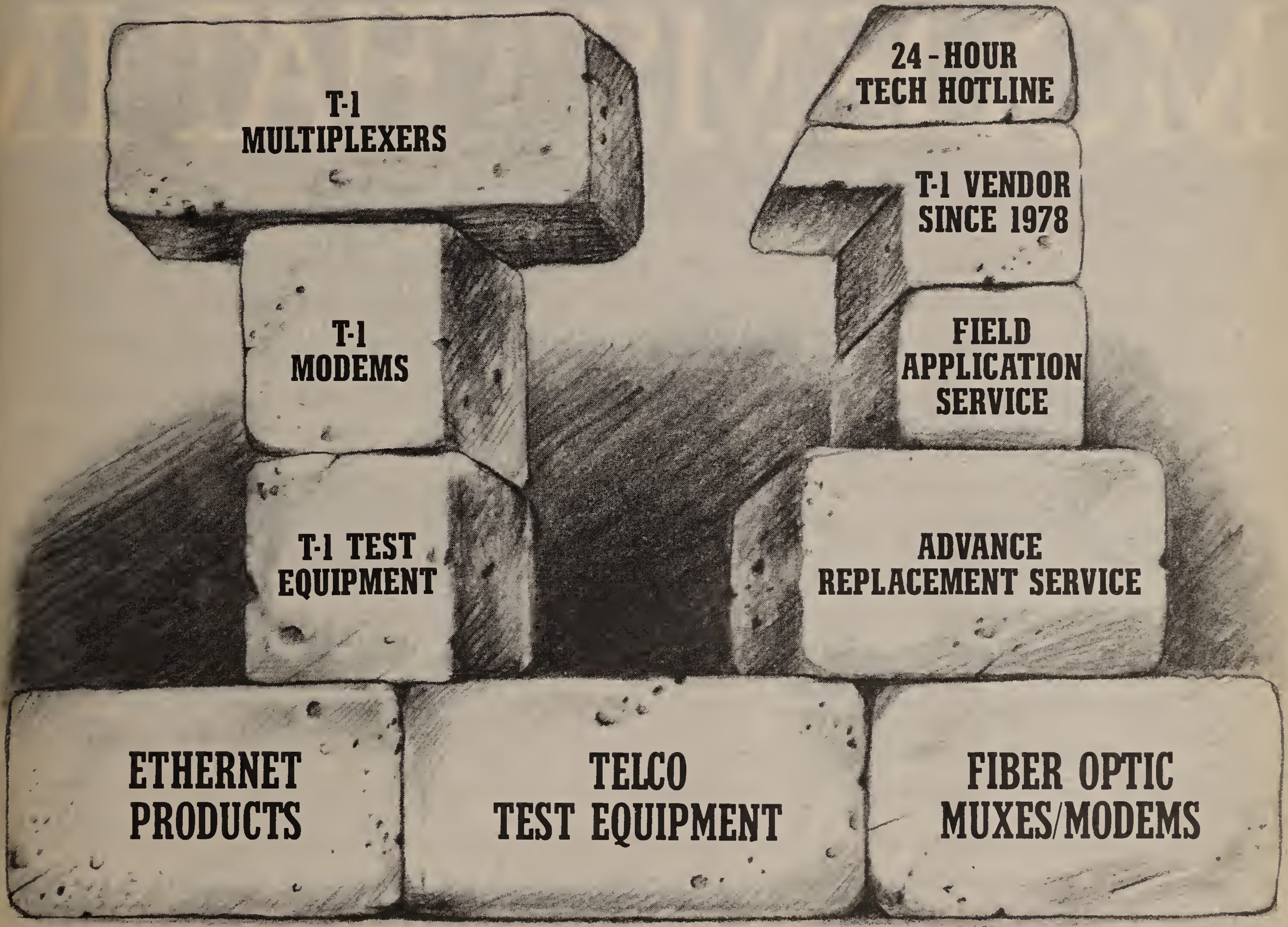

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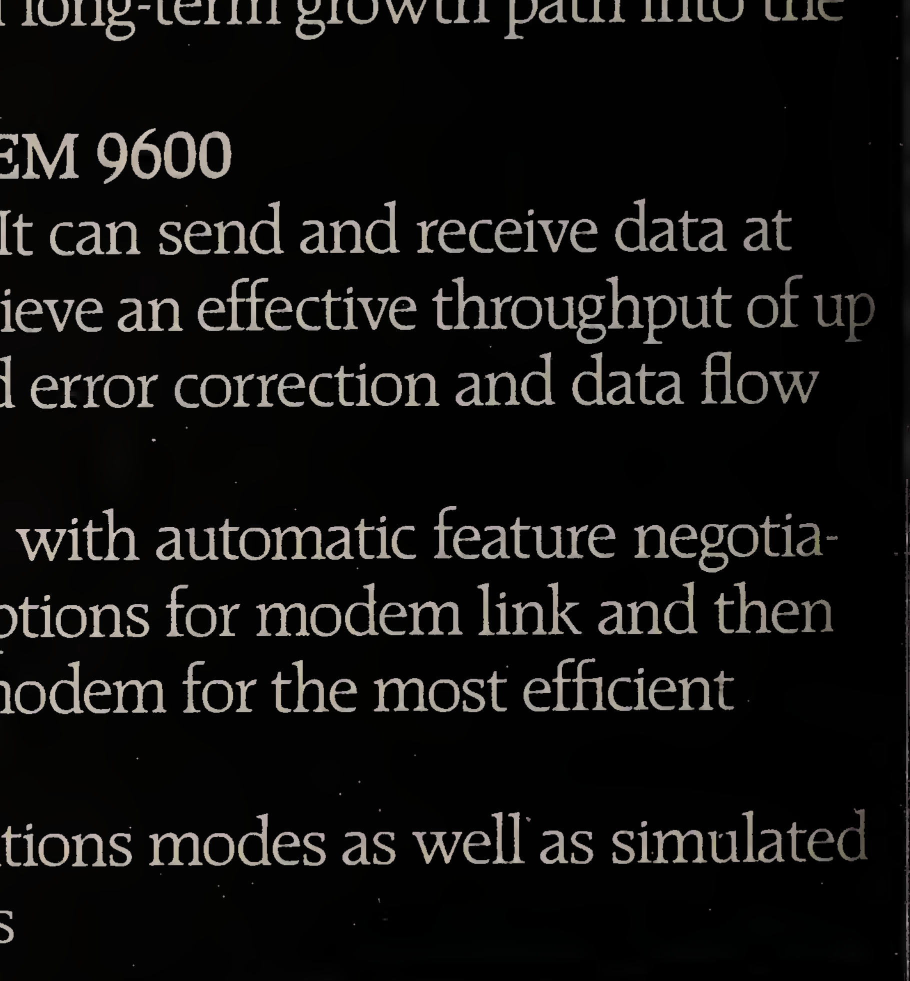

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X.400 IMPLEMENTATIONS

On the slow track

LAN vendors have fallen behind in the race to support the international messaging standard.

BY MICHAEL HURWICZ
Special to Network World

If it's true that X.400 is on the cusp of widespread implementation as an international standard for electronic messaging, why haven't local-area network vendors joined other major systems vendors in the race to announce products that comply with this nascent standard?

Major local-area network vendors say they recognize the importance of X.400 and are making plans to support it. On the other hand, they have yet to announce any X.400 products, claiming a weak demand for X.400 support on local networks. The trend is in favor of X.400, however, and compliant local net products should start appearing this year. But, for now, users have only vendor promises.

At the X.400 demonstration at Telecom '87 last October in Geneva — the largest yet — local-area network vendors were conspicuously absent. The exhibition featured such heavyweights as AT&T, British Telecommunications plc, Telenet Communications Corp., Dialcom, Inc., Digital Equipment Corp., Hewlett-Packard Co., Ing. C. Olivetti & Co., S.p.A., Unisys Corp. and, for the first time, IBM. In all, 21 vendors, service providers and government agencies participated in the X.400 demonstration, most using their current electronic mail software adapted to the X.400 standard.

At Telecom '87, Jim White, senior scientist for Telenet and chairman of the Consultative Committee on International Telephony and Telegraphy's X.400 committee, asked, "Where are the LAN vendors? They've all said they'll support X.400, but when? They don't realize how isolated they are. Meanwhile, minicomputer and mainframe vendors have begun to offer their users connections to other companies and countries."

Hurwicz is a free-lance writer and local-area network consultant based in Nashville.

Continued on page 67

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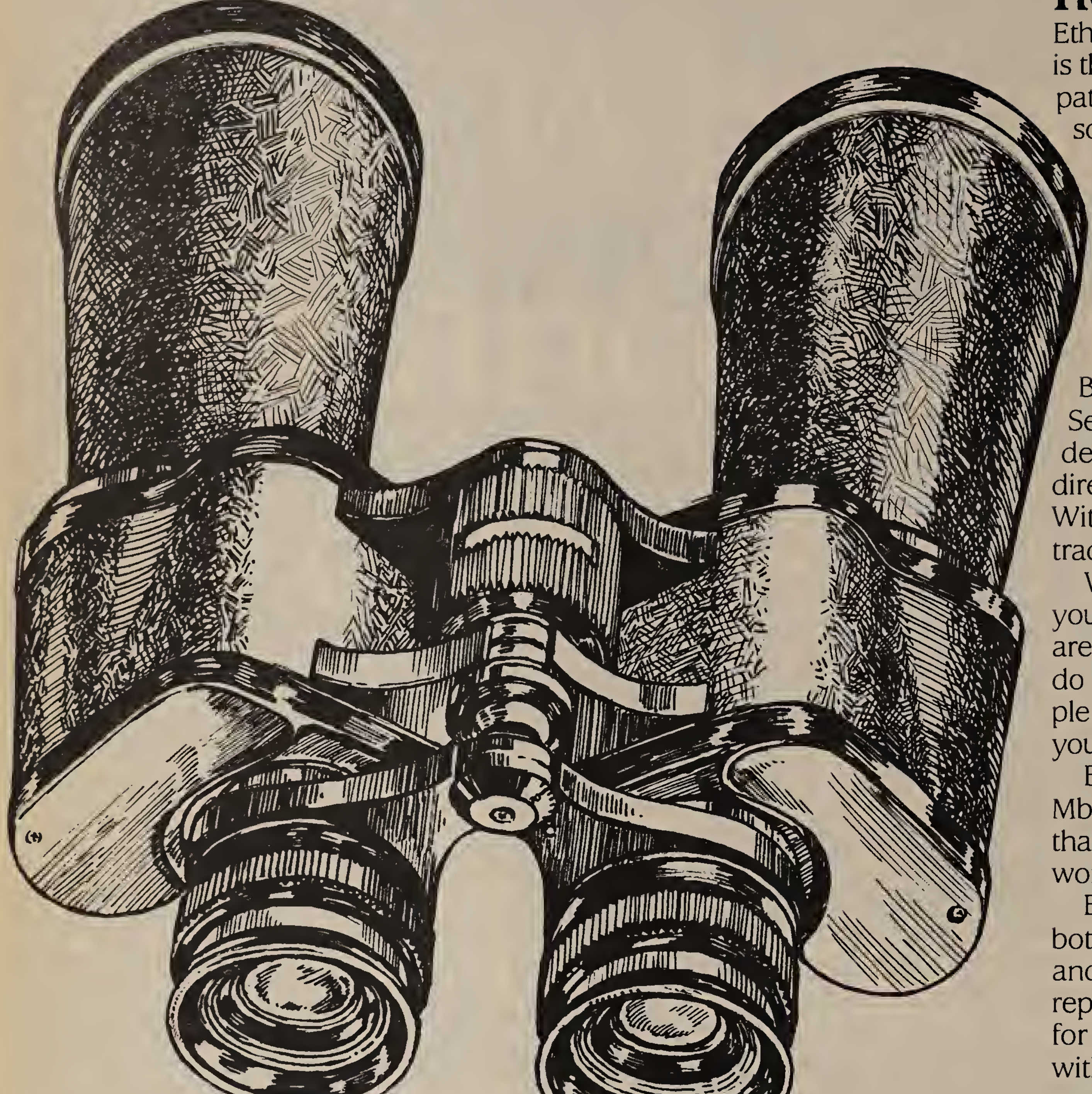
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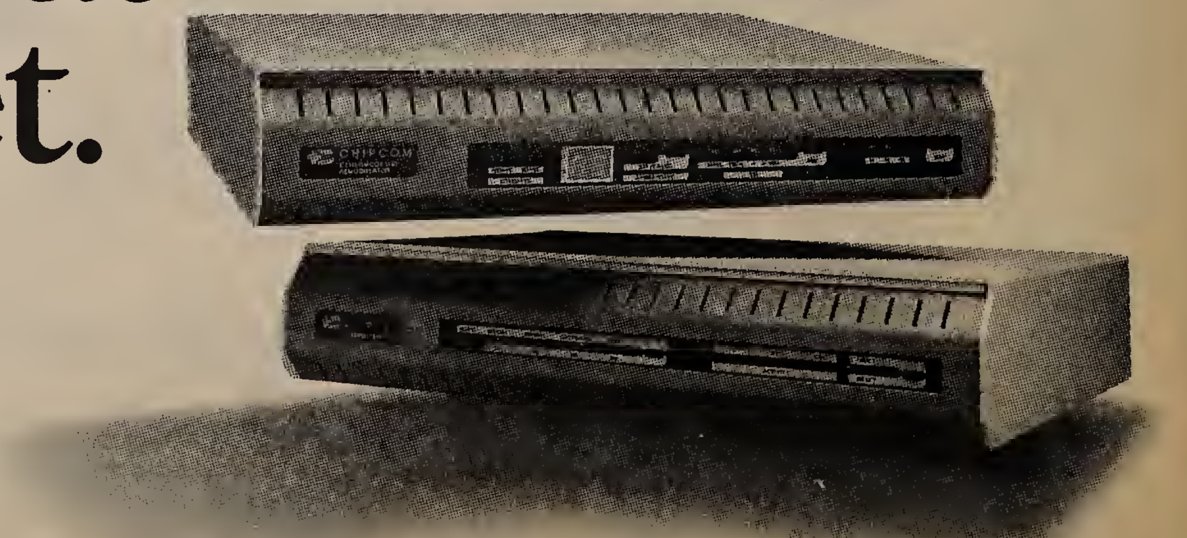

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From page 63

According to White, actual X.400 support will soon be a requirement for any vendor that wants to be considered a serious player in the E-mail market. "It's urgent that they get involved, because X.400 won't offer truly global messaging until it can reach all LAN users."

X.400 support solutions

Initially, the simplest way for local-area network vendors to offer X.400 connectivity will be to add an X.400 gateway to their existing E-mail systems. With this method, local network workstations use a proprietary E-mail system when communicating within the local network. For messages to be sent outside the local net environment, the gateway translates native E-mail messages into X.400 messages. This is a quick and easy way to give local-area network users the benefits of X.400. It leaves the existing proprietary E-mail system untouched, simplifying development efforts and confining bugs in the X.400 software to the X.400 gateway.

Vendors using a proprietary E-mail system may also choose to use a variation of X.400 within the local network with an X.400 gateway. The modified X.400 used within the local-area network may offer better features or performance or require less memory or disk space than a fully compatible X.400 system would. Proprietary E-mail systems that resemble X.400 make gateway software easier to write. And with fewer conversions to do, the gateway runs faster.

An alternative to the gateway approach is to implement a fully compliant X.400 E-mail system within the local network. This requires that vendors discard or revamp existing E-mail software. Vendors who have already designed their E-mail software with conversion to X.400 in mind may take this path.

While the gateway approach may be most popular initially, as the market matures and E-mail software is upgraded, partial and full implementations of X.400 E-mail systems will appear.

Local network vendors wishing to implement X.400 may choose to license a ready-made implementation from a software developer such as Santa Monica, Calif.-based Retix, Darmstadt, West Germany-based Danet, Vancouver-based Sydney Development Corp. or ICL of Bracknel, Berkshire, UK. The X.400 software would then be integrated with the local net vendor's current proprietary E-mail application or used as the basis for a new application. Integration with current E-mail applications could be accomplished by creating a gateway or by rewriting the existing application to make it X.400-compliant.

According to Dennis Cannon, E-mail product planning manager in DEC's Office and Information Systems Marketing Group, local network vendors could implement an X.400 gateway fairly easily using a MicroVAX and DEC's Message Router X.400 Gateway and its accompanying programmer's kit. DEC could even do the programming. The company has done similar jobs for between $50,000 and $300,000. The price to the end user for such a gateway would probably be under $20,000, Cannon estimates. That, however, would be too expensive for most users of small local networks.

A standards snafu

Efforts to come to market with local net-based X.400 software have long been hampered by the lack of a workable standard for allowing an X.400 user agent (UA) to operate remotely from an X.400 message transfer agent (MTA). (The UA lets the user post messages. The MTA forwards those messages. This is important on local-area networks because the typical local net workstation doesn't have the resources to implement both the UA and the MTA efficiently.)

The existing CCITT P3 protocol for remote UA-to-MTA communications, approved in 1984, was never widely implemented. P7, an enhanced version of P3, is now a CCITT draft recommendation and is expected to become a full-fledged CCITT recommendation at the plenary meeting in October 1988.

Almost the same text is at the draft proposal stage in the International Standards Organization (ISO) and is expected to become an ISO standard late in 1988.

Once P7 becomes a standard, users can expect to see implementations. However, at least two third-party vendors are planning products now. OMZIG, of Hull, Quebec, will offer X.400 messaging on Network Basic I/O System-compatible local-area networks in the first half of 1988, according to Sandy Black, director of product development.

Also, Interep Datacom of Geneva will implement X.400 with P7 on a NetWare local network using software from Sydney Development Corp., according to Patrick Vontobel, product manager for communications software at Interep.

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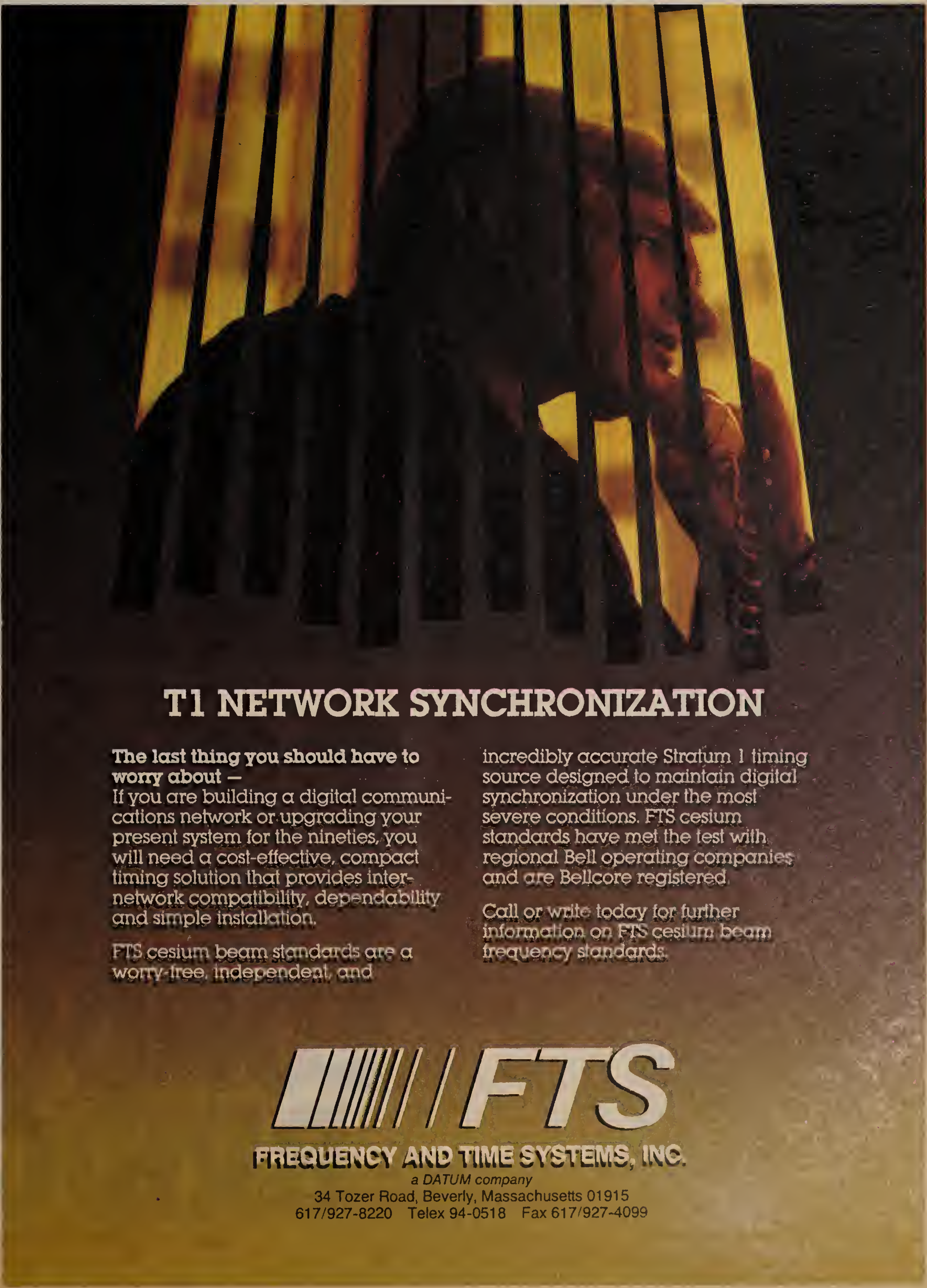

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From previous page

Waiting for P7 isn't the main reason for local net vendors' hesitation to implement X.400, however. Vendors say their priorities regarding X.400 reflect their customers' priorities. Users, they say, just aren't interested in X.400 yet.

Novell, Inc. says it intends to support X.400 through the Message Handling Service (MHS) developed by Action Technology, Inc. (ATI) of Emeryville, Calif. MHS is a store-and-forward messaging system that can accommodate multiple transport mechanisms, message formats and communications protocols. X.400 is among the first standards targeted for support under MHS. However, neither Novell nor ATI has made any X.400 product announcements yet.

"X.400 is important," says Chauncy Bell, ATI's vice-president for strategic development. "Our customers aren't demanding it yet, but they're going to. We have written X.400 capabilities into some contracts that we have to fulfill by mid-1988, so MHS will support X.400 by that time. But right now, we're more concerned with other issues, like adapting our software for use on [Apple Computer, Inc.] Macintoshes."

3Com Corp., based in Santa Clara, Calif., intends to support X.400 under OS/2. However, it may leave the task of providing the X.400 application to third-party vendors. Westborough, Mass.-based Banyan Systems, Inc. is also interested in supporting X.400 but hasn't announced any X.400-compatible products.

Michael Cavanagh, executive director of the Electronic Mail Association (EMA), an association of users and vendors in Washington, D.C., concedes that there is not currently a tremendous user demand for X.400 on local-area networks. But, he adds, "I'm not sure that's going to be true in June of '88. Some people argue that, in the relatively near future, X.400 is going to be driven mainly by users."

The reason? X.400 will provide a measure of safety in buying E-mail systems. If the system has X.400, users can be assured of a reasonable level of interconnection with many other systems.

"X.400 capability could well become an integral part of what a user demands of an equipment provider or LAN provider. It's premature — but only a shade premature -- to talk about user interest in X.400," Cavanagh concludes.

Todd Booth, who manages a 700-node token-ring network at the University of California at Los Angeles (UCLA), agrees that local net-based X.400 wouldn't be very useful to him now. Most of his E-mail goes over the federal government's Advanced Research Projects Agency Network, Bitnet (an academic network) and proprietary E-mail systems such as The Coordinator, a package based on ATI's MHS. None of these systems currently offers X.400 gateways, so an X.400 system on UCLA's local network wouldn't offer connectivity to the most commonly used systems. When these gateways are available, they will allow users to send messages on all the various mail systems using one application. That will greatly simplify users' lives.

"I'm not surprised that LAN vendors haven't been more active in X.400," says Richard Miller, president of Telematica, Inc., a Palo Alto, Calif.-based consultancy specializing in X.400. "They already have proprietary approaches for tying their own LAN-based E-mail systems together. They're not necessarily interested in building an X.400 system to allow you to connect to a competing vendor," he says. "Until there's a service [that supports X.400 connections] or a host-based community of X.400 systems, what have they got to tie into?"

X.400 services and host-based systems began to appear only during the last quarter of 1987. Service offerings came from Telenet and AT&T; for host-based systems, DEC, Hewlett-Packard and Unisys introduced products.

Also, mainframe and minicomputer vendors can charge far more for software than local-area net vendors can. Thus, host vendors can afford the huge investment required to be first out of the gate with X.400 systems. Local net vendors cannot.

"Their approach has been reasonable," Miller says. "They have to wait." Nevertheless, Miller predicts that, by mid-1988, all of the major local network vendors will have at least announced X.400-based local net E-mail systems.

Finally, even when local net vendors move into the X.400 fold and provide the necessary connections to other environments, universal messaging won't necessarily follow. Political problems in negotiating agreements between competing service providers and between countries will still occasionally prevent the interconnection of systems supporting X.400.

Nevertheless, the introduction of local-area network products that support X.400 will provide the key to a greatly expanded universe of potential correspondents for local net users. ◼

Airline net firm builds T-1, T-3

continued from page 2

tal Access and Cross-Connect Systems (DACS).

System One Telecommunications' current nationwide network features DACS and multiplexers purchased from Digital Switch Corp. The company also recently purchased packet switches from BBN Communications Corp. Plans call for the installation of 10 other large switches in the network, but the company would not say what type of switches it is considering.

Art Dunham, vice-president and chief operating officer for System One Telecommunications, said the nationwide fiber net's base will be completed by November. The entire network is expected to be operational by September 1989.

The firm currently handles the computerized reservation traffic for Continental and Eastern.

The System One Telecommunications contract is a big boost for Lightnet, which has signed several regional long-distance carriers and resellers but few users. CSX Corp. and Southern New England Telephone Co. own Lightnet jointly.

Dunham said System One Telecommunications offers prospective network users one- to five-year contracts and monthly arrangements for network services. He said he was not concerned about competing with well-established long-distance carriers such as AT&T, MCI Communications Corp. and US Sprint Communications Co.

"System One Telecommunications can provide better quality and support services," Dunham said. "We think members of the airline industry and other users will find our all-digital fiber-optic network attractive."

Dunham claimed System One Telecommunications has proven it can operate a nationwide private-line network. The firm currently manages a network that links more than 115,000 terminals worldwide and processes 780 million data transactions each month. The network also handles more than 15 million telephone calls and carries 65 million minutes of voice traffic each month. ☐

Response mixed on NTIA plan

continued from page 7

CompuServe, Inc., a Columbus, Ohio-based electronic data base service firm, said the NTIA wants the FCC to nullify the consent decree, although it wasn't a party to the antitrust case. In separate filings, CompuServe and Tandy Corp., a Fort Worth, Texas, consumer electronics company, disputed the NTIA's suggestion that U.S. consumers are being deprived of information services because of the absence of the RBHCs from this market.

No shortage of services

In response to NTIA's claim that RBHC entry into the information services market would help the U.S.' international trade position, Tandy said there is no shortage of information services, and CompuServe said that 67% of all electronic data bases originate in the U.S. The U.S. had a $2.5 billion trade surplus in the information services market last year, CompuServe said.

The Committee of Corporate Telecommunications Users said the NTIA's proposal was imprudent because FCC safeguards have not yet proven reliable.

Nynex Corp. and Pacific Telesis Group asked the FCC to wait for Judge Greene to issue his final order on information services before dealing with the NTIA's proposal. Last September, Greene ruled that the RBHCs could offer transmission services for information service providers, and he is expected to elaborate soon on the specific capabilities the RBHCs will be permitted to provide.

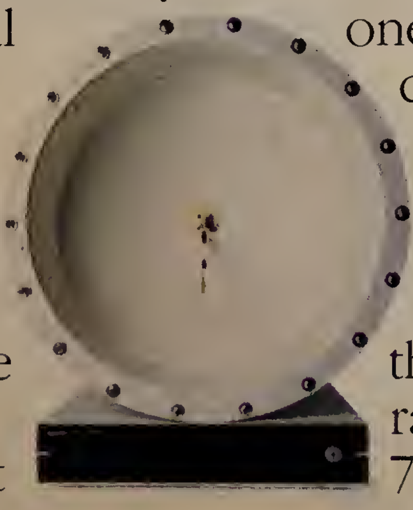
Conflict could delay services

Nynex cautioned the FCC against "forcing a jurisdictional dispute before the court has completed its deliberations on information services. Conflict would be contrary to previous efforts by both entities to foster cooperation and might well result in protracted litigation, thus delaying, rather than hastening, the introduction of information services," Nynex said in its filing.

Ameritech said Greene's ruling conflicts with the U.S. Congress' mandate to the FCC. "Congress gave the FCC the responsibility to decide whether or not RBHC provision of information services is in the public interest. In 1983, Congress charged the FCC with encouraging the delivery of new technologies and services to the American public," Ameritech's filing stated.

AT&T found the NTIA proposal, "unnecessary and puzzling," because the FCC has already ruled that it was in the public interest for the RBHCs to offer enhanced services and that those findings have not created a conflict with the court to date.

The FCC is not legally required to act on the NTIA's recommendation, and it has not yet set a date by which it will respond to the NTIA. ☐



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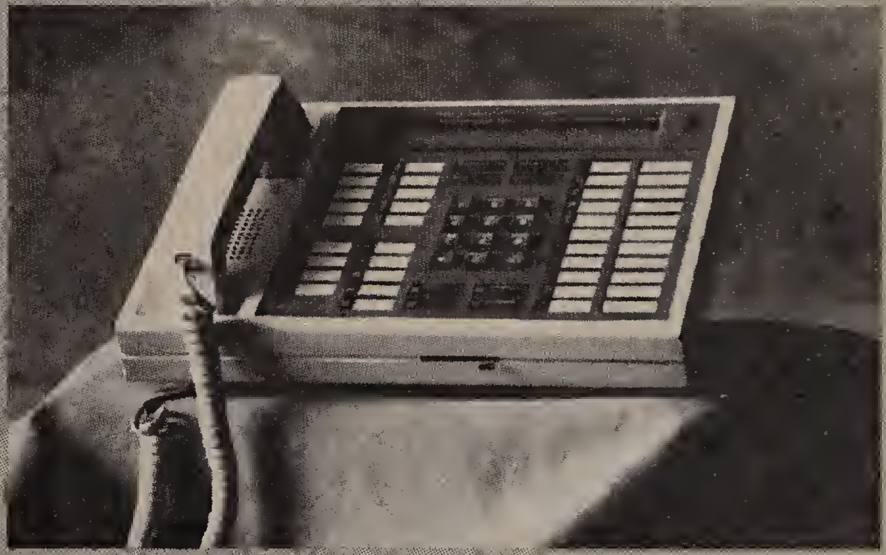

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UB unveils Access/One

continued from page 4

Access/One can be managed with a dedicated "supervisor" module that provides automatic fault detection, identification, reporting and recovery. That capability is important, according to industry analysts, because it is missing from similar Ethernet-over-twisted-pair products already on the market.

"With this type of product, we have the beginnings of a network management center that can take charge of the [local] network," said Thomas White, chairman of Infonetics, Inc., a consulting firm in Santa Clara, Calif. "It's an extremely flexible product, and it's a step ahead of the others in the market today."

Ungermann-Bass briefed White on the product prior to its announcement.

Ungermann-Bass already has a product, Net/One Token Ring, supporting token-ring networks over both shielded and nonshielded twisted-pair.

Conventional Ethernet networks use coaxial or fiber-optic cable as communications media. Telephone wiring has been thought incapable of handling high data rates, but in the past year, several companies have introduced products with the line-conditioning electronics necessary for the omnipresent twisted-pair wire to carry data at 10M bit/sec.

Like other products, Access/One sets a relatively short maximum distance between a workstation and the network hub. The Ungermann-Bass products specify a maximum of 100 meters, or 330 feet.

A debate over proposed standards for Ethernet over twisted pair has been raging in a specially appointed study group of the Institute of Electrical and Electronics Engineers. Ungermann-Bass has participated in the study group.

Access/One requires that two pairs of twisted-pair wire be used to link workstations to the network. That setup is backed by a standards proposal submitted to the IEEE group by Hewlett-Packard Co. and SynOptics Communications, Inc. Digital Equipment Corp. and 3Com Corp. have proposed a different standard that uses a single wiring pair to the workstation.

Not all twisted-pair wiring is capable of supporting Ethernet. Ungermann-Bass said it will perform on-site testing to determine the usefulness of a building's wiring for Access/One.

But most of the installed base of twisted-pair is built according to AT&T or Northern Telecom, Inc. specifications, both of which are stringent enough to support high data rates, according to Eric Killorin, publisher of "Netline," an industry newsletter sponsored by Hyatt Research Corp. in Andover, Mass.

Cabinet connections

Access/One is based around a cabinet with a punch-down block, power supply, data bus and slots for up to 11 interface modules. The cabinet is designed for installation in a wiring closet, which serves as a network hub, and is linked over a backbone to Access/Ones in other wiring closets.

Backbone connections are made via a network interface module. The module is available in two versions: the ASM-500 for baseband Ethernet over coaxial or fiber, and the ASM-550 for Ungermann-Bass' proprietary broadband Ethernet, Net/One.

Access to the twisted-pair subnetwork is provided by an Ethernet concentrator module in the cabinet and by a twisted-pair access unit (TPAU) on each workstation.

The concentrator modules can support up to 12 Ethernet devices each and can be cascaded one level, meaning that each board will support up to 12 additional boards.

The TPAU, about the size of a modem, attaches on one side to the workstation's Ethernet card and on the other side to an RJ-45 cable leading to the twisted-pair circuit.

Access to token-ring subnetworks is provided by a dedicated concentrator module. The token-ring module can coexist with all other Access/One modules.

An asynchronous interface module provides support for as many as eight asynchronous devices. An Access/One cabinet can be outfitted with as many as 10 of the asynchronous modules, providing a maximum capacity of 80 asynchronous ports per system.

For support of synchronous, IBM 3270 terminals, a 3270 module is provided. The maximum number of modules and ports is 10 and 80, respectively.

For network management, a supervisor module must be installed. The supervisor monitors the backbone interface, system temperature, power supply and operating status of individual modules. All fault conditions are reported to a network management console.

The cabinet and modules are priced separately. In total, a single Access/One system ranges from $10,000 to $25,000.

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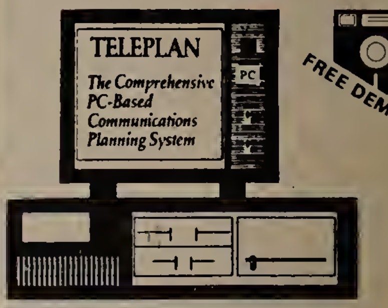
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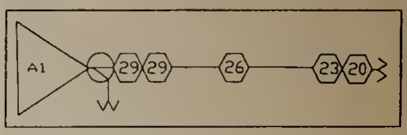

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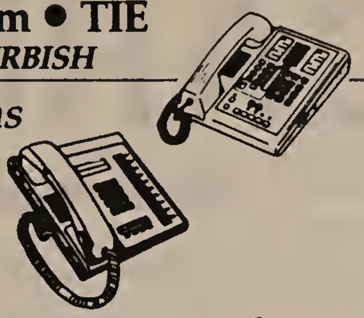

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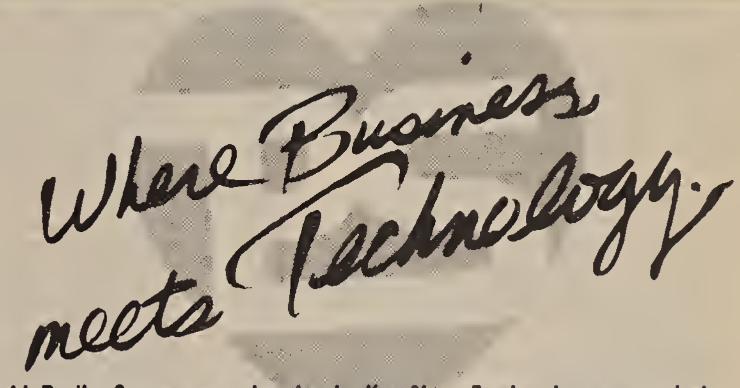
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Resumes must be received by March 11, 1988.
NASA IS AN EQUAL OPPORTUNITY EMPLOYER

Banks increase use of EDI

continued from page 1

for cost savings and strategic benefits are, like GM, beginning to demand that their banks develop corporate trade-payment services to complement the electronic order and invoice systems.

With a single EDI message, a company can instruct its bank to pay several thousand bills by transferring funds directly to the accounts of its suppliers. Mellon found out the hard way that companies are beginning to take EDI seriously.

"Pittsburgh National Bank was much more responsive to GM's needs and saw EDI as a way to gain an entree to PPG that it didn't have already," said Michael Manion, manager of treasury services consulting with the management consulting firm of Coopers & Lybrand in Chicago.

There was a management shakeup at Mellon shortly after the GM affair, according to Bailey. The new management team has been more responsive to its clients and has improved its EDI services. Due to those changes, PPG is now using Mellon to process payments to PPG's suppliers in the chemical industry.

"Now we have the luxury in Pittsburgh of having two very good corporate trade-payment banks to choose from. We're now back to splitting our business between the two," Bailey said.

Demand will continue to grow

According to Manion, the demand for EDI-based corporate payment services will continue to grow over the next five years. "Our research indicates corporate customers overwhelmingly expect their banks to have EDI services — particularly corporate trade-payment services — available when they demand it," he said.

Coopers & Lybrand, along with the Bank Administration Institute (BAI) of Rolling Meadows, Ill., and EDI Strategies, Inc. of Marietta, Ga., recently published a study about EDI business opportunities for financial institutions. That study was commissioned by 12 major financial institutions.

"Companies are increasingly going to make EDI the way they do business. In line with that, banks ought to look at implementing services that utilize EDI as a strategic way of positioning themselves to serve their corporate clients," said Steve Ledford, a contributor to the study and managing director of corporate services and technologies for BAI.

A financial institution that molds its EDI payment services to meet the specific needs of clients committed to EDI will retain a competitive advantage with those customers, Ledford said.

But, he added, some companies will not consider the lack of EDI payment services a good enough reason to switch banks. Those companies will remain loyal to their financial institutions in order to get services other financial institutions do not offer, such as strong cash management and investment services, he said.

While some major corporations use EDI for corporate trade payments, most corporations use EDI to exchange purchase orders and invoices electronically.

"An EDI network can make firms much more nimble and competitive. It saves them money and makes them more responsive to customers," said Mark Rudov, president of Wellesley, Mass.-based market consulting firm Telematics Resource Group. "A principal node in an EDI network is a bank. If more and more companies insist on using EDI, the banks that want that business are going to have to comply."

Processing corporate trade payments via EDI can supplant a financial institution's so-called lockbox service. With a lockbox, customers send payments directly to a post office box at suppliers' banks. The financial institution charges its clients a fee for processing those payments.

EDI can streamline that lockbox service by enabling a supplier's customers to instruct their own banks to electronically move funds to the supplier's bank account.

That process reduces the cost of sorting incoming paper checks, thus enabling the financial institution to lower the fee it charges clients to process payment orders and support higher transaction volumes with existing staff, Telematics' Rudov said.

In order to offer EDI services, financial institutions need to implement software compatible with that of their clients and link to the EDI network serving their clients.

There are basically two types of EDI networks. One is a proprietary network providing links between companies that frequently do business with one another, such as an automaker and an auto parts supplier.

In this type of network, financial institutions have to lease a link dedicated to that network.

Trading partners can also exchange EDI transactions via a third-party EDI network, which simply requires banks to establish links to the networks used by their

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clients.

Manion said the study pinpointed General Electric Information Services, McDonnell Douglas' Integrated Business Systems Division's EDI-Net and Sterling Software's Ordernet as the three dominant third-party networks. Those three networks control about half of the EDI network market.

In an EDI transaction, a supplier receives an electronic purchase order from a customer. The supplier processes that order and delivers an EDI message to the customer when the products are being shipped.

When the shipment is received, the customer checks the products received against the original order and sends a "shipment received" message to the supplier. The supplier then forwards an invoice to the customer.

At this point, the customer has, in the past, written a check to pay that invoice and mailed it to the supplier or the supplier's financial institution. With corporate trade payments, the customer can instruct its financial institution via an EDI message to transfer the needed funds to the supplier's financial institution.

The actual electronic movement of funds can be transmitted over either existing EDI networks or via existing network links between financial institutions.

A single EDI payment transaction can order the payment of several thousand invoices. The financial institution processing that payment order must forward the detail explaining which invoice is being paid to the financial institution receiving the payment. The financial institution receiving that payment then forwards a "payment received" message to its client via the EDI network.

Most of the nation's largest financial institutions already offer EDI payment services. "The banks have to say, 'Well, maybe our volume of electronic payments right now is not all that great, but we better be in a position to handle an increase, as these different industries evolve from just handling purchase orders or invoices to using EDI for electronic payments,' " Manion said. ☑

ENE highlights MAP/TOP

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targeted at users with different job functions in various industries. Sessions aimed at executives will focus on strategic planning and cost savings potential, while management sessions will address topics such as tactical planning and cost control. Technical sessions will address operating parameters and technical building blocks.

Industry-oriented sessions will cover five areas: the public sector; finance; manufacturing and design; sales, marketing and distribution; and all sectors, which will emphasize areas common to all industry segments. In addition, workshops covering areas such as network media, X.400 and electronic document interchange will be conducted.

The massive investment in ENE '88 is geared to one major goal: to convince users that products based on MAP/TOP standards are here today. To date, demand for products based on earlier versions of MAP and TOP has been low. Many purchases were stalled when users chose to wait for Version 3.0 products, and vendors slowed development of MAP 2.1 and TOP 1.0 products.

The migration path for 3.0 will be "graceful additions, not changes," said Mike Kaminski, MAP program manager.

MAP and TOP specifications were brought together in the 3.0 specification, and new functionality was added. For example, the OSI Presentation Layer, or Layer 6, which was missing from the MAP 2.1 specification, was added to Version 3.0.

Network management and directory services, missing in the earlier MAP/TOP versions, were also incorporated in 3.0. In addition, a form of the specification known as MiniMAP was defined for the process industries.

The MAP/TOP Users Group has agreed not to change the 3.0 specification for six years, in an effort to protect users' investments in applications and vendors' investments in product development. "We've driven a stake in the ground," said Mike Kaminski, MAP program manager at GM's Advanced Engineering Staff and program manager for ENE '88. The migration path for 3.0 will be "graceful additions, not changes," he said.

Vendors have invested heavily in developing products based on MAP and TOP 3.0, and many such products are expected to debut at the ENE '88 event. Vendors that have committed to having commercial MAP/TOP 3.0 products available shortly after the event include Micom-Interlan, Inc., GE Fanuc Automation North America, Inc., Concord Communications, Inc., Hewlett-Packard Co., Burr-Brown Corp., Motorola, Inc. and Retix. ☑

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New service to replace EPSCS

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a voice service, CNO is expected to support voice and data traffic, according to industry sources. The shared service will be targeted at current EPSCS users and other large companies.

CNO will be more economical than EPSCS, and AT&T is expected to offer volume discounts. AT&T told EPSCS users it will begin cutting over the service in the fourth quarter, according to customers and industry analysts familiar with the plan.

AT&T declined to comment on the specifics of CNO but said it has been discussing potential new services and service upgrades with the EPSCS Users Group and other customers.

James Maretz, a senior network engineer with Cigna Corp. in Vorhees, N.J., said AT&T representatives have been meeting with the EPSCS Users Group to negotiate service and pricing options for CNO. Cigna, an insurance and financial services company, is an EPSCS user.

Some EPSCS customers said they were familiar with CNO but could not discuss it because they signed nondisclosure agreements with AT&T.

The CNO network will consist of 60 access points in cities around the country, compared with EPSCS, which has 17, according to an EPSCS user who asked not to be identified. About 20 of those nodes will consist of high-capacity digital 5ESS switches that AT&T has begun deploying as part of an EPSCS network upgrade announced late last year ("AT&T agrees to upgrade EPSCS," *NW*, Nov. 30).

The remaining 40 network entry points will be able to route traffic over high-bandwidth T-1 circuits to the 5ESS backbone switches.

The increased number of network entry points is expected to provide the savings in access and transport costs that EPSCS users have been asking for, according to an industry analyst.

"Today, EPSCS users in many cases have to route their traffic great distances to reach those 17 nodes," he said. "The ever-increasing cost of local access, coupled with the cost of long-haul transport, is really putting the squeeze on these users."

CNO will support high-speed data transmission — an option that EPSCS lacks. Even after the 5ESS upgrade, users will still only be able to transmit low-speed data.

CNO will support both dedicated and switched connections as well as subrate multiplexing, and it will be based on Common Channel Signaling 7.

AT&T's decision to replace EPSCS with CNO is a direct result of pressure from AT&T's largest and most powerful users, according to an industry analyst familiar with AT&T's CNO strategy.

AT&T's EPSCS users include PPG Industries, Inc., Bethlehem Steel Corp., North American Philips Corp., Xerox Corp., Eastman Kodak Co. and Marriott Corp.

Industry analyst Robert Ellis, president of The Aries Group, Inc. in Rockville, Md., said it's high time for AT&T to replace EPSCS.

"EPSCS is a Paleolithic approach to networking," he said. "In terms of features and functionality, EPSCS is really lagging behind other services. It's imperative for AT&T to respond to the needs of its largest customers."

AT&T has already lost a number of former EPSCS clients to other services, one of those being its own Software-Defined Network service. Users who have migrated from EPSCS include Transamerica Information Services, Unisys Corp., E.I DuPont de Nemours & Co., General Motors Corp. and Mobil Corp.

AT&T is also expected to offer inducements to encourage users to make long-term commitments to CNO.

AT&T has indicated it will offer volume discounts to customers willing to sign three- to five-year contracts and who pledge to use a predetermined volume of service, Cigna's Maretz said.

"The higher your commitment for voice traffic, the greater your discount on data transmission," said Maretz, who has run some preliminary computer models comparing CNO costs to EPSCS costs, using data supplied by AT&T.

AT&T's pricing strategy is to induce these large customers to give AT&T all of their voice and data business, the analyst said.

AT&T has indicated that EPSCS customers who do not sign long-term contracts will automatically be cut over to CNO, but service will be on a month-to-month basis, Maretz said. "CNO isn't going to be an option for EPSCS customers. CNO is a direct replacement for EPSCS," he said.

CNO is expected to attract a wider following than EPSCS, given the anticipated cost savings. Users with slightly lower call volumes than the current EPSCS users — 10,000 to 30,000 calls per day — will be able to cost-justify CNO because it will have a lower break-even point than EPSCS, the analyst said. ◘

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US Sprint woes continue

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worse, not better, since Snedaker made his pledge.

"Everything is messed up now," he said. "We have received no bills for the past several months. You name the problem, and we've had it. [US Sprint] still has serious problems with its billing system."

Another user, who also asked not to be named, echoed the fact that US Sprint's billing problems have worsened.

His story, as a National Accounts user based in Texas, is a litany of complaints about US Sprint's billing practices. "We have never received a totally accurate bill from US Sprint," he said.

After a year of delays and inaccuracies, the user said, "we reached a point where the September bill had August usage data on it, and all the previous months were finally cleaned up." But the progress was short-lived. Since October, the customer has received only one bill.

"Yesterday, we got a bill that was sent out Dec. 22, but we didn't get the call-detail records with it, so I don't know which months they are billing for." However, he said he does know that a number of fixed monthly charges, such as T-1 and access charges, are incorrect.

Bob Schwartz, vice-president of an agency called Bill Correctors, Inc., handles a number of US Sprint accounts. Bill Correctors analyzes and resolves billing questions for users. According to Schwartz, there has been very little improvement in US Sprint's billing system. Although some bills now reflect calls made more recently, credits are still months behind, he said.

"We have a couple of major accounts, Fortune 200 companies, that [sent money to US Sprint] in May or June. A letter of credit confirmation was sent in July, but the credits didn't hit the system until September and didn't show up on the customer's bill until October or November," Schwartz said. "How do you run a business like that?"

US Sprint's inability to credit promptly has led to another problem. Schwartz said US Sprint will make dunning calls to its customers in the false belief that a payment is overdue.

However, a number of National Accounts users hastened to US Sprint's defense, saying the carrier has been careful not to dun a big customer no matter what the carrier's records show.

Jerry Demner, lead analyst with the telecommunications group at The Home Insurance Co. in New York, said he has had dunning problems with other carriers but never with US Sprint. "MCI has taken eight months to put a credit through for us, and [in the meantime], the dunning people were jumping all over us. We don't have that problem with US Sprint."

If US Sprint has failed in its plan to straighten out the billing system, it has set its National Accounts managers to the task of alleviating some of the strain for users. Several large users said their National Accounts managers have personally analyzed customers' bills to check for mistakes and to issue credits where necessary.

Haerland at Unisys said, "We are somewhat buffered by the fact that our National Accounts team goes through all our billing to make sure we haven't been misbilled for anything. That takes care of a big part of the problem."

The National Accounts user in Texas agreed. "US Sprint has done everything from a customer service function that could result in a satisfied customer," he said. "The National Accounts team says to trust them on the billing issue. US Sprint is working hard to keep its commitments. It is just not working on schedule." ◻

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Users offer strategies

continued from page 1

used to integrate all of a customer's stand-alone products into one package. The new network cuts down on paperwork and gives customer service representatives fast access to customer account records, which are used to determine whether a customer qualifies for ChemPlus benefits such as lower mortgage rates and higher certificate-of-deposit rates.

"If knowing your customer underpins your judgment, then the technology you get will give you a competitive advantage — and it will justify those big outlays," said Thomas Johnson, president of Chemical New York Corp. and Chemical Bank.

The first step in getting better acquainted with your business is conducting and reviewing a companywide inventory of communications services and products being used, said Jerry Eisen, president of Office Sciences International, Inc., a consulting firm in Iselin, N.J.

"Inevitably, when an inventory is done, the company will be surprised at how much it spends on communications," Eisen said.

Conducting the inventory plays a pivotal role in getting representatives from all divisions of a business involved, he said.

This involvement was the primary objective of Ed Youngberg, director of corporate telecommunications at The Prudential Insurance Company of America in Newark, N.J., when his company initiated a strategic plan in September 1985.

Youngberg met individually with the heads of his company's 22 major business units to discuss what communications equipment and services they needed. "First we prioritized the needs of each unit," Youngberg said. "We then made a plan for the company as a whole — an amalgamation of all the plans."

Within a year, Youngberg rallied companywide approval for PruNet, a nationwide T-1 network for voice and data integration that the company is currently installing.

"I am convinced that selling the plan to management went smoothly because of the participatory system we used," he said.

Forming an Operations Policy Committee (OPC) that included every division manager "validated the integral role of technology in our business and mandated a corporationwide policy for future investments," said Chemical Bank's Johnson.

Through OPC, Chemical Bank "demanded a written statement of strategic goals from every division manager," Johnson said. "We ended up squeezing an automation strategy from all our businesses almost by edict, and we gained the obvious side benefit of forcing some levels in the organization to articulate their business strategies better than they had before." These statements were the foundation for the plan that Chemical Bank drafted.

Once every department has contributed to the plan, the business and technical people work out the details together. After they spell out what they plan to do and what they will need, the technology people get their moment in the spotlight.

While many plans are changed quarterly, companies and consultants agreed that strategic plans should last at least two years.

"Even if you make adjustments to your plan, setting a specific number of years forces you to think about the future," said Youngberg, whose company's plan is for five years.

Prudential's plan might not seem long, but it is by today's standards, said Frank Dzubeck, president and CEO of Communications Network Architects, Inc. in Washington, D.C. Today's standard plan is closer to three years, he said.

Rapidly changing technology and seesawing service prices are among the forces that necessitate a shorter planning period, consultants said.

But no matter how much time the plan spans, it must be flexible to accommodate for changes in both technology and the company, Eisen said.

"It's better to be too specific than to be too general as long as you allow for flexibility," he said. "Most plans are too general."

One of the most frustrating parts of planning a net strategy is that the planning process usually lasts about as long as the life cycle of the networks being used.

"You finish one plan and it's already time to come up with a new one," said one large company's spokesman, who asked not to be identified.

The next most distressing part of planning is waiting for a return on investment. Those who have drafted strategic plans preach patience.

"You can't expect to make a profit on every network you install," said Keith Sparks, manager of network operations at Piedmont Aviation, Inc. in Winston-Salem, N.C. Sparks said he figures his company's networks last about three years. "You hope to at least be able to add onto your network when it comes time to make a new plan."

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Feb. 2-3, 4-5, San Francisco — Data Comm I, Data Comm II. Contact: Center for Advanced Professional Education, 1820 E. Garry St., Santa Ana, Calif. 92705.

Feb. 4, Irvine, Calif. — Strategic Networking: Maximizing your Connectivity Investment. Contact: Banyan Systems, 115 Flanders Road, Westboro, Mass. 01581.

Feb. 8-10, Dallas — The IBM PS/2 Series & the IBM PC/XT Technology. Contact: Data-Tech Institute, Box 2429, Clifton, N.J. 07015.

Feb. 8-10, Washington, D.C. — Introduction to Data Communications. Contact: Systems Technology Forum, 10201 Lee Highway, Fairfax, Va. 22030.

Feb. 8-11, Dallas — UniForum 88: The Fifth Annual International Conference of Unix Systems Users. Contact: UniForum 1988, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

Feb. 16-18, New York — Dexpo East '88 Conference. Contact: Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

Feb. 22-24, Boston — PC LANs: A Manager's Guide. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Feb. 23-25, Chicago — Telecommunications Management. Contact: Business Communications Review, BCR Enterprises, Inc., 50 York Road, Hinsdale, Ill. 60521.

Feb. 24-26, Monterey, Calif. — Advanced Local Telecommunications & The Future of the RBOCs. Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

Feb. 25, Houston — The Nuts and Bolts of Voice/Data Integration. Contact: Southwest Communications Association, P.O. Box 53417, Houston, Texas 77052.

March 2-4, Washington, D.C. — Satellite VII: New Market Opportunities in Satellite Communications and Broadcasting. Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

March 21-23, Arlington, Va. — COMPSTAN '88: Computer Standards Conference. Contact: James Hall, National Bureau of Standards, Technology Building, Room B266, Gaithersburg, Md. 20899.

March 22-23, New York — CRISIS '88: Distribution Channels for PBX, Key and Centrex. Contact: The Eastern Management Group, 4 Century Drive, Parsippany, N.J. 07054.

▶ *PRODUCT COMPARISON*

Plug-in cards turn PC to PAD

BY JOHN J. HUNTER
Contributing Editor

Many companies like the idea of using packet switching to let multiple users reach many computers, but they don't want to be bothered with establishing a private network. Others feel that public packet networks are perfectly acceptable carriers, but they want to use personal computers, not asynchronous terminals, to access them.

For both types of users, one answer is to use plug-in boards that allow standard IBM Personal Computers and compatibles to perform packet assembly and disassembly, protocol conversion and terminal-emulation services. These units also provide the interfacing required to access the more popular packet networks.

Two products that do this are Atlantic Research Corp.'s XPERT and Icot Network Systems, Inc.'s (INS) X.25 Adapter. They also furnish packet-controller-like services such as network user identification and reverse charging.

A market emerges

Using Personal Computers as packet assembler/disassemblers is a relatively new application that's growing in popularity. The primary reason for this is price.

The board-level products are less expensive on a per-channel basis than conventional stand-alone PADs because they allow packet services to be extended to installations that could not normally cost-justify them. And both products listed above permit Personal Computers — as opposed to dumb ASCII terminals — to be used as the accessing vehicle. These products also allow the use of high-performance synchronous modems.

Both XPERT and the INS X.25 Adapter occupy one card slot in an IBM Personal Computer, Personal Computer XT, Personal Computer AT or Personal System/2. In addition, they contain their own microprocessors, memory and software that handle packet assembly and disassembly as well as terminal-emulation and packet-service interface functions.

Both products run under IBM's PC-DOS or MS-DOS Release 2.0 or higher, and DOS 3.3 when used on the Personal System/2. Both boards also support IBM's Systems Network Architecture/Synchronous Data Link Control and Network Basic I/O System protocols.

Personal System/2 support is different, though. The INS X.25 Adapter operates with the Personal System/2 Micro Channel, while XPERT uses the Personal Computer bus only. However, according to Atlantic Research, the Personal System/2 Model 30 is supported using that architecture.

Personal System/2 compatibility is a significant advantage for both offerings; customers don't need to be concerned about product obsolescence when moving from one generation of personal computer to another.

Emulation abilities

Terminal emulation is an important capability with PADs and switches, since it determines which host processors can be accessed.

For overall capabilities, XPERT is the clear winner. It emulates IBM 3278 Model 2, 3279 Model 2A and 3780 workstations as well as the 3287 printer. For asynchronous hosts, it also emulates Digital Equipment Corp.'s VT52/100, Tektronix, Inc.'s 4006, Zentec Corp.'s ADM-3, Soroc Technology, Inc.'s IQ 140, and Data General Corp.'s 200 terminals.

By contrast, the INS X.25 Adapter emulates no asynchronous terminals; it only supports the IBM 3278, 3279 and 3287.

Two PC PAD products compared

	Vendor/Product	
	Atlantic Research Corp. Springfield, Va./ XPERT	Icot Network Systems, Inc. Mobile, Ala./ X.25 Adapter
Asynchronous emulation	✓	
IBM 3270 emulation	✓	✓
Price	$1,295	$995

PAD = Packet assember/disassembler

SOURCE: TMS CORP., DEVON, PA.

The INS X.25 Adapter and XPERT both do IBM 3270 emulation well: Neither requires an external IBM 3X74 controller to establish a link or SNA session with the host computer. Rather, a 3270 message stream is emulated. That's important because it extends IBM 3270 support to locations that otherwise might not be able to cost-justify such a connection.

Both products implement 1976 and 1980 CCITT specifications for X.25, and they support Link Access Procedure B (LAP B). LAP B is optional on XPERT. PAD capabilities comply with CCITT X.28, X.29 and X.3 recommendations, and both support IBM's Qualified Link Level Control (QLLC) protocol, which permits SNA PU 2, LU 1, LU 2 and LU 3 sessions.

In addition, XPERT also supports the Display System Protocol (DSP) and Display System Interface (DSI) standards. DSP 1 relates to the Telenet 1983 specifications. DSP 2 complies with the 1983 specifications for Datapac, Canada's packet network service. DSI is part of Datapac's 3303 specifications for attaching to the Canadian packet network.

Although both products support LAP B, neither has implemented the Modulo 128 extended numbering option, which allows 127 frames to be sequenced. Only Modulo 8, which permits seven sequenced frames, is supported.

Modulo 8 support could be a significant limitation if, for instance, large files are being transferred. But for interactive applications, it is less of a problem. For users doing file transfers, XPERT supports X.25's file-transfer facility (XFT). The INS X.25 Adapter does not.

Multisession options

For a particular data transmission, the INS X.25 Adapter and XPERT users can select two window sizes — one for each transmission direction. The size of the packet transmitted can be 128 bytes, while those that are input can be twice as long, or 256 bytes. The XPERT packet window can be set to transmit two packets and receive seven. The INS X.25 Adapter can be set to transmit or receive at any figure up to seven.

Both products permit up to three simultaneous remote sessions, plus the establishment of an MS-DOS session, and the user can hot-key between them. The advantage of XPERT is in its overall emulation facilities that support asynchronous and host accessing. Since the INS X.25 Adapter emulates only the IBM 3270, its sessions are limited to two terminal logical units and one printer logical unit.

As for communications speeds, INS X.25 Adapter's top rate is 19.2K bit/sec — half that of the XPERT. The physical interfaces are also different. The INS X.25 Adapter uses the CCITT-recommended X.21, but XPERT supports X.21bis. The latter is functionally equivalent to RS-232-C and has been accepted by the CCITT as an X.25 interface because the availability of X.21-interfaced equipment is limited, especially in the U.S.

Whether X.21bis gives XPERT a connectivity edge depends on the terminal equipment used and the public packet service to which the customer wishes to subscribe.

Both products offer additional user services such as reverse charging, multiple closed users groups and network user identification codes.

The latter is part of the CCITT 1984 recommendation and accommodates user identification, billing and on-line facilities registration. On-line facilities registration also allows users to communicate with public packet networks to change their subscription parameters.

Public packet networks are the backbone over which products such as XPERT and INS X.25 Adapter operate and all PADS and packet switches using such services must be certified.

INS X.25 Adapter has certifications from Telenet Communications Corp.'s Telenet and Uninet, Tymnet, McDonnell Douglas Network Systems Co.'s Tymnet, Canada's Datapac, UK's PSS, Finland's Datapak and Digipak, West Germany's Datex-P and Israel's Isranet. To date, the XPERT unit has been certified on Telenet, Tymnet, Canada's Datapac and France's Transpac.

User review

Network World was unable to interview any INS X.25 Adapter users but did speak with XPERT user John Owens, branch chief of network support with the U.S. Department of Agriculture in St. Louis, Mo.

Owens' group supports about 2,000 offices employing XPERT in conjunction with AT&T 6300 personal computers. Terminals are connected to Telenet through leased 2,400 bit/sec lines, and each user typically runs up to three concurrent sessions.

According to Owens, his network has been a long-time user of Telenet, which provided the protocol conversion and transmission services needed to allow users to access IBM host computers. The combination of asynchronous communications and the poor quality of the leased lines in some regions where his offices are located prompted the move to synchronous communications.

"We were experiencing a number of [data] errors, but that headache is gone since we moved to synchronous communications," he says. "We're also getting error correction now."

Owens' group has been using XPERT for about two years, and it reports no significant problems. Owens did note two features he finds appealing. One is the simplicity of operation and the other is the centralized diagnostics XPERT offers.

"The users seem to like the menu. It asks them what they want to do and where they want to go," he says. "It makes establishing [different] sessions pretty easy."

Final judgment

Judging which of these products is better depends on the application. For those needing the ability to communicate with asynchronous hosts, XPERT is the choice. It also has an edge with its XFT facilities, plus the X.21bis support. Other than that, the products seem evenly matched. ☐

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

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